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HOW TO COOK AND WHY

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EDITOR'S INTRODUCTION

THIS book has been written to meet two sets of needs, those of the girl of high-school age and those of the average housekeeper. The high-school girl studying cookery under a teacher with scientific training needs a simple book to remind her of the principles she is hearing about and which she herself is practising in the school kitchen. The average housekeeper, deeply interested in the responsibility she has in preserving the health of her family, needs a book that is easy to refer to and that will give her broad, general principles without going so far into details that she finds it impractical to follow. The book Miss Condit and Miss Long have written together meets these two needs admirably.

The question the housekeeper asks for to-day, and the high-school girl asks in order that she may be prepared for to-morrow, in the end comes to something like this: "How can I plan the food of the family so as to give them the right foods rightly prepared *at the least cost?*" This book in dealing with the subject of preparation

stands between the two questions of food values and food cost, and necessarily deals with both.

The authors have had practical experience in their own homes as well as wide experience in teaching cookery to girls and women. They are enthusiastic over the possibilities of the value of scientific knowledge to the tens of thousands of home-makers who have not had scientific training. They have written the book in the hope of doing a service to all such home-makers, to the teachers of classes of older girls—whether in high school, Y. W. C. A., settlement, or elsewhere—and to the girls themselves. They are not offering a contribution to scientific research, but a "first aid" to the girl or woman who wants to take advantage of the research that has been done. It is the service of the *middleman* between the laboratory of science and the kitchen of the school or home.

ISABEL ELY LORD.

Pratt Institute, BROOKLYN, *June*, 1914.

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I

WHY WE EAT FOOD

THIS book is not written for people like the housewife who said in a tone of virtuous rebuke: "I give very little time to cooking. We eat to live only." It is written in the hope that it may help those who realize that health, happiness, and success depend upon the wise selection of food and its careful, intelligent preparation.

The old saying goes, "Tell me what you eat, and I will tell you what you are." If we serve only potatoes and salt, the salt may be fine, the potatoes white and mealy. It is not an elaborate meal of many intricate dishes that is an expression of the truest refinement and intelligence. One or two foods perfectly cooked and served satisfy the true epicure as well as meet the needs of the body.

Often people express great dislike for a dish they

have never tasted. This is particularly true in families who have lived in one locality for a generation. They will eat only such dishes as their family has always served. Travel and acquaintance with other peoples and with what they eat break up these prejudices and give experience on the basis of which a wise selection of food may be made.

To us Americans come every year hordes of foreigners who have foods and different ways of cooking and preparing them that are new to us. If we are ready to learn from all of them we can enrich our diet incalculably. The thrifty French, German, Italian, Slavic, or Scandinavian housewife, who has for generations considered cooking an art and who knows how to get the greatest return for the money spent, has a contribution to make to our own national life.

Happiness is the best aid to good digestion. We all eat the food which appeals most strongly to our individual tastes. Remembering this, the wise housemother is ingenious in devices to cultivate the tastes of her family. For example, she will make palatable to them a wide variety of vegetables. She will cook these to retain the greatest amount of nourishment, and serve them in so attractive a way that one who had before disliked them is inspired to eat them. A thoughtful care for the taste of foods to be served together, the combining of flavors which increase and add interest to one another—all these are of the

utmost importance. It is dull indeed to sit at a table where potatoes, rice, and macaroni are served, or chops and fried egg-plant are followed by pie for dessert!

The science of feeding teaches us more important reasons for taking care in the selection and preparation of food than De Wolcott considered when he wrote the lines:

The turnpike road to people's hearts I find
Lies through their mouths, or I mistake mankind.

We know why certain foods must be given the growing child. We know that our soldiers can march longer with less fatigue if we feed them correctly. We know that our grandparents better retain their youthful spirits and activity if they eat the foods adapted to their age and occupation. We know that the child at school does good work with enjoyment only when he or she comes to school after the right breakfast and brings the right lunch.

The most important point for most homemakers is to find out how to know what food to eat without taking a long, scientific course in some college. No training can be too thorough for the woman who has the responsibility of the health and happiness of a family, but the house-mother who cannot take long courses in a school should not be discouraged. She can master a few general facts, she can learn a few general

principles, and she can use the knowledge life has taught.

Man has always eaten and always will eat food, because our bodies need food. When we are children, food is needed in order that we may grow, and when we are full grown it is needed to repair tissue, so that we can move about and do our work in the world. Sometimes we forget that it takes strength to digest our food, to pump the blood to all parts of the body, and generally to keep the body in working-order. Food gives the energy for all these activities. We must have the food best suited to do the particular work required that we may be "healthy, wealthy, and wise." The medical folk talk about "body tone," which means keeping the muscular tissues in the very best condition, ready to respond to every demand. Or, again, the medical books talk of keeping the muscles "elastic."

Few people, moreover, realize the effort the body makes to keep an even temperature. On a hot day in summer the sweat-pores open to cool the body off. On a cold winter's day the blood flows more quickly, carrying the necessary food to keep all parts warm. Everybody knows how important it is to keep the temperature of the body even, whatever the season. The doctor is sent for as quickly on a hot day in August if the body temperature goes up as he would be on a cold winter's day. The body exercises a wise supervision over itself, regulating the tempera-

ture, replacing worn-out tissues, or strengthening weakened ones.

One reason why the feeding of children is so important is that their bodies are rapidly building as well as repairing worn-out tissue, and their future health depends upon the kind of bodies built at this time. An adult must accept his body as it is and make the best of it. The adult's need, then, is to repair worn-out tissue—except in the case of the athlete, who by muscular exercise and food enlarges his muscles. Or if the body has fallen away—below its normal size—either from lack of food or by the ravage of disease, it must be rebuilt. And most wonderful of all is the nourishing of the baby's body from the mother's.

II

WHAT FOOD IS

FOOD is any material which when taken into the body can be used to build up tissue or create energy. With the great variety of foods to choose from, how is the housekeeper to select that which will build the healthiest bodies and give the largest return in energy for the money she has to spend?

Wise economy demands that the feeding-stuffs which are at command shall be so combined that there shall be no waste of either material or energy. To be able to choose foods wisely the housekeeper must know how foods differ in their nutritive properties. Most people do not need the scientist to tell them that some foods contain more fat or more sugar or more water than others. It does, however, take the scientist to tell us how much of each of these substances any given food contains.

As an aid to this knowledge, the substances which are found in foods have been separated into five classes called food principles. These are water, fat, mineral matter, starch and sugar (called carbohydrates), and protein. Scarcely

any food is made up of one of these principles alone, almost all containing several in combination. The food principles each play a special and definite part in the life of the body.

Water. About two-thirds of the body is water. It enters into the composition of the nerves, muscles, blood, and even the bones. It is as important a cleanser inside the body as it is outside, in addition to its value in keeping the fluids, like the blood and digestive juices, liquid enough to do their work. It also helps regulate the body temperature.

To give the body water enough to do all these things the individual needs at least five pints a day. Many foods contribute water, but from the ordinary diet we get only about one-third the necessary quantity. The rest must be taken as a beverage. This means at least six glasses a day, and it is wiser to drink more. The safe way to insure drinking the full amount is to establish the habit of drinking one or two glasses at certain definite times.

This food requirement is, fortunately, not an expensive one. Perhaps the very abundance of water makes us forget its great importance. A person can go without other food for many days, but only a very few days without water. The intelligent housekeeper sees to it that her family is supplied with pure water. Where there is any doubt of its purity she carefully boils and cools it for the family to drink.

Fat. Fat is obtained practically uncombined with other food principles in butter, olive-oil, and other oils. However, most foods contain some fat. In digestion fat is changed *very* little. Its use to the life of the body is to give energy, either as heat or as activity.

If more fat is eaten than is needed at any particular time to keep the body warm or for energy, it is stored in the body ready to use some day when enough is not taken. This fat stored in the body acts as a protection and cushion to the delicate organs. Of course, there can easily be too much stored in the body, as is often the case when food rich in fat is eaten by people who exercise little. Many families are spending money for more fat in their food than is good for them. The amount needed for perfect health and activity could be obtained for much less cost. The relative money and food value of the many fats should be studied by the housekeeper who must practise economy.

Many people have a constitutional tendency to overweight, and diet to counteract this. It is always wise to do this under a physician's directions, as there is danger of under-nourishment in such cases. The use of drugs to reduce weight is a serious risk, as the drugs that produce this result affect the heart action. The person who eats and exercises normally and is still too fat should consult a physician.

Mineral Matter. Mineral matter is found in

most of the vegetables, in all of the fruits, in meat, in milk. Indeed, in almost every food are found one or more of the mineral salts. It is for this reason that the housekeeper need not concern herself especially about the amount of mineral matter the daily meals furnish. A well-varied diet supplies a sufficient amount of mineral salts, at least for the grown-up members of the family. The food of the children must be chosen more carefully in this regard. The growing tissues need more mineral matter to make the strong and healthy body. Much experimental and practical evidence shows that what often is pronounced a case of "malnutrition" is due, not to insufficient food, but to a lack of mineral matter.

Sugar and Starch. These are familiar to all. Starch is changed to sugar in digestion. The scientific name for these foods is carbohydrates. These very valuable food principles are found in many foods, usually—except in the case of refined sugar—in combination with one or more of the other food principles. Starch and sugar give heat to the body and energy for muscular activity.

The choice of foods contributing starch and sugar to the family food in the right amounts is an important matter. In Holland and Italy we find the average housekeeper using a greater variety of vegetables and procuring the starch and sugar for her family for less money than does the average American housekeeper. To do this the housekeeper should make up her own tables

showing which vegetables give the largest amount of starch for the least money.

Where there is great muscular activity, such as digging, working on a farm, or severe athletic exercise, more starch and sugar are required. A student, bookkeeper, or clerk needs starch and sugar, too, but not as great a quantity as does the ball-player or plowman.

The active children need it, and the future health of their bodies will suffer if it is not provided in the correct amounts and kinds.

Protein. This most important food principle is found in many foods, but more abundantly in meat, milk, eggs, and the legumes (peas, beans, lentils). It contains all the elements of the other food principles, and adds to these the building or repairing of the body. It can maintain the life of the body, if necessary, but its most important work is to build the muscular tissues. It is the protein in the milk which makes the baby's body grow. Protein is the only food principle which does build muscular tissue. Every housekeeper is concerned about the protein food for her family, whether she expresses it in scientific terms as the protein factor or talks about the value of meat and meat substitutes.

The foods rich in protein are the most expensive foods. Experience has taught their necessity. Science is now teaching us the difference in the protein found in different foods, the amount of protein the growing child needs to build a strong,

healthy body, the amount the adult needs to repair the body.

Science is a much quicker, kinder teacher than is experience. We can learn, if we will, without suffering, that when protein is eaten to keep the body warm and give muscular energy, the tax on the body is much greater than when starch, sugar, or fat is used for heat and energy. Nor need rheumatism and other ills be suffered because we have no way of knowing when we are eating too large an amount of protein. Tables and figures accessible to all state the approximate amount of the different food principles required for the healthiest life of the body, according to age, size, occupation, and climate. One is given at the end of this chapter.

The measure used to estimate foods, in the tables referred to, is heat. To find the value of any food it is burned in a machine called a bomb-calorimeter. The heat produced by each specific food is tabulated. In a still more complicated machine a person is put, and fed the foods before tested. Accurate measurement is made of any difference in weight, temperature, or activity, and it has been found that the measurement of food by burning agrees very nearly with the measurement of its use in the body.

Because we must have a name to give this measure of heat produced by a food, the heat-unit *calorie* has been chosen. A calorie is simply the amount of heat required to raise the tem-

perature of one kilogram of water through one degree on the Centigrade thermometer. That is about the amount of heat required to raise four pounds of water through one degree of the Fahrenheit thermometer.

The statement that one pound of beef yields 1,559 calories, or that one pound of cheese yields 1,994 calories, or that one pound of potatoes yields 2,596 calories, simply means that each of these foods would produce the stated amount of heat if burned. When they are eaten they are burned in the body and produce energy.

Digestion. The intelligent housekeeper must understand the general facts of digestion to feed her family in the best and most economical way.

All foods should be ground up in the mouth. The main reason for this is that the food when it reaches the stomach should be in small particles, in order that it may be reached by the digestive juices. The digestion of starch is begun in the mouth, which makes another reason for thorough mastication of all foods containing starch. From the mouth all food goes to the stomach, where it is made more liquid by the addition of gastric juices. The protein foods—milk, meat, eggs—are here digested.

The most important part of the digestive tract is the long intestinal tube where the food goes after leaving the stomach. The intestinal juices finish the digestion of all foods and prepare the fat to be used by the body. From the small in-

testines the blood takes the digested food to different parts of the body, the protein foods to build and rebuild tissues and also to give heat and energy, the sugars to the muscles to give heat and energy, the mineral matter to the bone and other tissues.

To get the best work from our bodies food must be provided in the right quantity to meet all its needs. Where there is great activity, or in very cold weather, more sugar and fat are needed. Much of the sugar may be supplied by fruits and vegetables or by the so-called starch foods—cereals, grains, potatoes, and the like.

The chemical analyses of the different foods are given in detail in the United States Government Farmers' Bulletins, also tables showing the digestibility of the different foods. These bulletins about foods can be obtained at a nominal price from the United States Department of Agriculture at Washington, D. C., or they may be obtained free through a Congressman.

There are two dangers confronting the housekeeper in feeding her family where an abundant table is provided. The first danger is that of overtaxing the digestive system by loading it with foods not needed for the life of the body. The second danger is that of providing too large a quantity of one kind of food and not enough of another kind.

The intelligent housekeeper practising true economy must know: (1) current market price of a food; (2) chemical analysis of a food; (3)

how digestible the food is; (4) the needs of the body to be fed. Knowing these facts, she compares money cost and food values before buying. For instance, she compares the price of a pound each of rice, potatoes, carrots, and macaroni. Which offers the largest quantity of starch for the money? Is one of these foods more easily digested than another? Does any one of those mentioned give a larger quantity of other food than starch? Of the foods mentioned, rice will give the largest return in starch for the money, and macaroni in protein.

There is no royal road of ease or magic path to reduce the cost of living. Knowledge and experience must be acquired and put to practice in the selection and preparation of food.

Dr. Henry C. Sherman,[1] in his *Chemistry of Food and Nutrition*, gives the following table of the daily requirement in food:

Boys	of 14–17 years	2500–3000 calories
Girls	of 14–17 years	2200–2600 calories
Children	of 10–13 years	1800–2000 calories
Children	of 6–9 years	1400–2000 calories
Children	of 2–5 years	1200–1500 calories
Children	of 1–2 years	900–1200 calories

"In general it appears that the food requirements of men and women of equal activity are

[1] The authors wish to acknowledge the courtesy of Dr. Sherman and of the Macmillan Company, publishers of his book.

in proportion to their body weight—women on the average weigh about eight-tenths as much as men—and it is commonly assumed that if equally active their food requirements will stand in the same proportion."

Tigerstedt, in his book of *Physiology*, gives estimates of the daily food requirements for different degrees of activity, indicating the intensity of the work by means of typical occupations:

2001–2400	calories	suffice	for	a shoemaker.
2401–2700	"	"	"	a weaver.
2701–3200	"	"	"	a carpenter or mason.
3201–4100	"	"	"	a farm laborer.
4101–5000	"	"	"	an excavator.
Over 5000	"	"	"	a lumberman.

III

THE VALUE OF CEREALS

THE reply to Johnson's slighting description of oats in his dictionary as "a grain used in Scotland for human food, but in England for horses," is, "Where will you find such men, and where such horses?" The story rightly understood illustrates the value of oats as a food, and is as true now as it was in Johnson's day.

The grains of the other grasses used as cereal foods—wheat, corn, rye, and barley—also rank high as economical, healthful foods.

The preparation of grains for food, before the housekeeper uses them, varies slightly. In all cases the outer husk is removed. In some instances the grain is then cleaned, dried, and used whole as food—as is rice—but usually the cleaned grain is ground as a part of its preparation for food. Sometimes, as in wheat, the germ is removed, because the cereal or flour keeps better. In many breakfast foods and flours the bran is sifted out. This is done in the modern milling of wheat flour and in the more common commercial corn meals.

Composition. Bran is a thin, woody fiber or cellulose found in many of the grains as a coat or husk. Bran (or cellulose in any form) is not used to any extent by the body for food. Its chief value in the diet is to add bulk. It does stimulate the movement of the food in the digestive tract, and for this reason cereals with their bran are often recommended as food for people troubled with constipation. The stimulation is due not only to the larger bulk of the bran, but also to the effect of some of the mineral matter held in it. The mineral matter probably stimulates the muscles of the intestines to greater activity in carrying the food along the tube.

However, it is not safe to say that coarse cereals are always better food than those more elaborately milled. The choice depends entirely upon the individual. Any intestinal irritation is increased, and sometimes fermentation is caused, by the presence of coarse bran. Morning headaches, irritability, and nervousness are a few of the signs we all know of this far too common trouble. Many children are scolded for bad temper when the real trouble is that their porridge was not cooked long enough to soften the tough outer coat of the grain. Nothing will so quickly or effectually destroy the good spirit of an adult or a child as intestinal irritation.

Inclosed in the cellulose walls of the cereals we find starch, their chief contribution to the nourishment of the body. This means, as we

have seen before, a high percentage of energy. Many of the grains used as cereals also contain a good deal of protein, making them an important addition to the daily food, especially to any meal that has no meat. But probably more important still is the amount and kind of mineral matter found in grains. It is partly because of the mineral matter that a cereal properly cooked is valuable food for children.

Cereals are especially important in the diet when the menu lacks meat. From the table on page 30 it will be seen how much protein there is in the cereals—rice and barley being the only ones that contribute little. Some cereals have more fat than others; oatmeal, for example, has a conspicuously large amount of both fat and protein. The amount of fat varies not only in different grains, but also in the commercial products from the same grain. Hominy and samp, made from corn, contain little fat compared with corn meal, which is the whole grain ground. Usually fat in some form is added to cereals in the cooking or is served with them as cream, milk, or butter. When this is done the amount of fat contributed to the diet by some specific cereal is not so important. The table on following page will show at a glance which cereals have the highest food value, which are richest in fat, or protein, or starch and sugar, or mineral matter.

Parkes gives the following order of merit "of

the common grains in respect to their organic principles":

PROTEIN	FAT	STARCH	MINERAL MATTER
Wheat	Oats	Rice	Barley
Barley	Corn	Corn	Oats
Rye	Barley	Wheat	Wheat
Oats	Rye	Rye	Rye
Corn	Wheat	Oats	Corn
Rice	Rice	Barley	Rice

The wise buyer knows that the manufacturer does not always tell the whole story in printing the composition or food value of a food on the package. And he knows also that the manufactured article cannot have any more nutritive value than the grain from which it was made. In some cases molasses or glucose is added to change the flavor, or the grain is toasted—a process which makes it more easily digested. Neither of these processes adds to the amount of nourishment provided by the cereal.

Cost. The table on page 30 shows also what the cost of each is, so that the amount of nourishment bought with a certain amount of money can be calculated easily. For example, if protein is the main interest, oatmeal offers more than do the other cereals; yet it should be noted that wheat ranks rather higher in nutritive value, because it is more easily digested. If a person could eat just one cereal food, corn-meal would be the cheapest, oatmeal next, then wheat.

A soup-plate of porridge made with Quaker Oats gives the same amount of protein as two and a quarter slices of white bread one inch thick from a five-cent loaf, but two slices would give as much energy as the porridge. If the bread were spread with butter, it would be equal in fuel value to a plateful of porridge and one-third pint of milk. The mineral matter of the porridge and the bread would be about the same. One cent will buy a little more rice than it will macaroni. While the rice contributes a large quantity of starch, the macaroni is really the more valuable food because of the protein it provides.

Let us choose two combinations — one, four tablespoonfuls of cooked rolled oats, served with one cup of milk; the other, one egg and a slice of bread or toast without butter. The first gives more protein than the second, more starch and sugar, more fat, enough more in all to give almost twice the energy value of the second, yet the first costs a cent less than the second. "A penny saved is a penny earned." The aggregate of the pennies saved in a large family by such a choice of food will represent the interest on a considerable sum of money. With the average family of five the saving would amount to 5 cents a day, which is 35 cents a week, which is $18.20 a year, or the earnings of $600 at three per cent. interest.

It is only by considering the relative food value and cost of different foods, and by appre-

ciating what it means to save even a penny every day, that the great cost-of-living problem is going to be solved.

The ready-to-eat cereals commend themselves to those whose time is money. For the housemother whose chief business is housekeeping the uncooked cereals will make the greatest return for the money spent. A cent's worth of oatmeal when cooked is as much as the very heartiest laboring man can eat. A cent's worth of cornmeal makes a breakfast for him, and there will be some left to fry for supper. A cent's worth of a ready-to-eat cereal is less—one shredded-wheat biscuit or a dainty dish of corn flakes. The saving all depends upon the value of the cook's time. For uncooked cereals she expends time in preparation, for the ready-to-eat cereals she expends money. True economy for one family may be extravagance for another family. The intelligent housewife considers all these facts in order to make a wise decision.

Cereals as they are prepared for market are comparatively free from water. This, of course, must be supplied in cooking, but it is one point on the side of cost. When the housekeeper buys cereals she is not paying for a large amount of water.

In many of the grains the mineral matter is closely associated with the outer husk, and when this is taken off in the milling the valuable mineral matter is lost. This is especially true in the American preparation of rice, for the white,

highly glazed rice which has been so much in demand is very deficient in mineral matter. The housekeeper who has the health of her family and the economy of her household most in mind will demand from her grocer the unpolished rice. It is still difficult to get this, but it is coming more into use, and every grocer will be forced to carry unpolished rice if his patrons demand it. *Uncoated* rice is sometimes sold as "unpolished," but has not the same food value, as the outer husk has been removed. At one time not long ago a disease called beri-beri broke out in the Chinese army. Scientific investigation found that this occurred where the main article of diet was polished rice. To cure the disease no medicine was given, but small amounts of the substance polished off from the rice were fed, and rapid recovery was the result.

Macaroni. Macaroni, vermicelli, and Italian pastes are made from wheat flours rich in protein. The flour is made into a paste with water, molded or drawn into tubes, dried or slightly baked. Macaroni is a highly nutritous food. Although when cooked it is about eight times poorer in protein than a similar weight of beef, the starch contributed to the diet makes it a valuable substitute for potatoes and rice. Macaroni is very thoroughly absorbed, and contributes almost eight times the amount of protein contributed by an equal weight of potatoes, and a great deal more than rice.

Few American housekeepers realize that macaroni paste is made up into any other form than that of the larger or smaller tubes, but in the Italian food-shops many variations may be bought, small and large. They make a pleasing variety, and are particularly helpful in tempting children to eat a dish that is a valuable addition to their diet.

Noodles are also made of wheat flour. They are very digestible, economical, and can be served in a number of different ways. They can be made at home or bought of grocers. Most people are familar with noodle-soup. The noodles browned in butter are a palatable change. They may be cooked and served in all ways like macaroni.

Cooking. As is seen by referring to the table on page 30, a great part of any grain is starch. Each minute particle of starch is enveloped in a tough wall. To make the cereal easily digestible this wall must be broken down so that the starch itself may be cooked. This is done by putting the cereal into *boiling water.* It is put into the water for two reasons—to supply water, and to expose the grain at once to a very high temperature. To get the best results the cereal should be poured into the boiling water very slowly, so that the temperature of the water is not greatly lowered, and so that the starch grain may be at once completely surrounded by the great heat.

To add to the flavor salt is dissolved in the water before the cereal is added—one teaspoonful

of salt to one pint of water. Some housekeepers believe that it is better to cook the cereal for a short time before adding the salt, as salt makes the water hard and the cooking goes on better in soft water. While there is some reason in this, the general opinion gives the greater value on the side of flavor to dissolving the salt in the water before the cereal is added. As has been said before, there is practically no water in cereals. They absorb large amounts, as will be seen from the table on page 30, which shows how one or two tablespoonfuls of raw cereal make five or six tablespoonfuls of cooked cereal. For example, five tablespoonfuls of raw oatmeal become nine tablespoonfuls when cooked. The increase is chiefly water.

When the cereal has been well blended in the boiling water, the cooking must continue directly over the fire for five or ten minutes, the time depending upon the kind of cereal, the amount of water, and the length of time required for the final cooking. (For this see the table on page 29). At the end of the five or ten minutes the cereal should be removed to a double boiler (for which see page 221) or a fireless cooker (for which see page 222), so that the starch may be subjected to a long, slow, even temperature to steam and soften it.

Rice and macaroni (which is cooked like a cereal) when cooked should be taken from the steamer or pan and rinsed in cold water, to remove the particles of starch that might make

the grains stick together. Each grain of cooked rice and each piece of cooked macaroni should be distinct. Rice should be reheated in the oven. Macaroni can be reheated in the same way, or, better still, in the sauce in which it is to be served. Cheese is frequently added to macaroni, increasing its value to the body as well as its attractiveness to the taste.

It is true that many of the cereals upon the market have been ground and steam-cooked as a preparation for sale; but it is a safe rule always to cook them at least twice as long as is directed on the package. The cooking of the cereals plays another part besides the important one of breaking down the wall around the starch. Heat produces a change in starch so it is more easily acted upon by the digestive juices. Any food to be used by the body must be soluble—that is, capable of being dissolved. Every one knows that sugar is soluble in water and that fat is not. Raw starch is not soluble. The preparation of laundry starch illustrates to the eye the change produced in starch by heat. The lump of starch is mixed with cold water, and on standing it sinks to the bottom of the pan; when the mixture of water and starch is heated it becomes jelly-like, the starch having absorbed the water. Dry starch when acted upon by heat is also changed to a more soluble form. This is one reason why toasted bread is more quickly assimilated by the body than the untoasted.

As the digestion of starch is started by the saliva in the mouth, starchy food should remain in the mouth long enough to be thoroughly mixed with saliva. Hence it is well to serve cereal in not too liquid a form. If in a semi-liquid condition, most people will swallow it before the saliva touches it.

Gruels. Cereals form a most valuable addition to the diet of invalids and children. When used for this purpose the cooking is a more important matter than when used by people in normal health. The cooking should be longer, and the tough outer coat should not only be softened by long cooking, but should be removed by straining. To this strained substance is added milk to make the desired consistency—a very thin gruel for young children, and a thicker consistency for the invalid and for the baby who has learned to eat from a spoon. It is important that the cooking of gruels be long enough to change the starch to a nearly soluble condition. Since gruels are almost liquid foods, they are not held in the mouth long enough for the saliva to affect the starch, and they must be cooked longer than the cereals served thick. A good rule is to cook them until every particle is soft and the mass is jelly-like. It will form a jelly upon standing.

It is usually thought that the cereals with the most fat should be omitted from the menu during warm weather, and theoretically this seems reasonable; but experience shows that in children's

diet oatmeal is valuable all the year round. Every housewife knows, however, that a change of cereal is most acceptable to her family. The same cereal served day after day is usually monotonous, and there will be a happier household where there is variety.

Fruit. Fruits are often served with or immediately preceding cereals at breakfast. This is regarded by some authorities as an unwise combination. When the fruit is strongly acid, experience teaches many people to eat it after rather than before the cereal.

Sugar. It is wise to encourage a taste for cereal without sugar. As the starch is converted to sugar in the process of digestion, to add sugar is like carrying coal to Newcastle. Sugar also kills the flavor of the cereal, adds to the expense of the dish where it is not necessary to increase either expense or nutritive value, and sometimes causes fermentation in the digestive tract. If a sweet flavor is desired, the addition of figs or dates served with cereal gives this flavor and increases the energy value of the dish.

Left-over Cereals. When some of the cereal cooked for breakfast is left it should never be thrown away. Many attractive dishes may be made from it. Fried corn-meal, rice pudding, rice croquettes, or rice baked with cheese are well-established dishes; but cream-of-wheat griddle-cakes and cream of wheat as a dessert are not so often utilized, nor is it so well known

that the cold cooked cereal can be used to make delicious muffins and griddle-cakes, the cold cereal being substituted for part of the flour. The drier the cold cereal the more exact can be the amount substituted for the flour left out.

Home-made Cereals. Some people advocate the use of home-made cereals, and it is a suggestion well worth following. Stale bread can be thoroughly dried and lightly browned in the oven. When this is crushed by using a meat-grinder or a rolling-pin, and served with milk or cream, it is as delicious a breakfast food as any on the market.

The Care of Cereals. If a number of cereals are kept on hand in order to vary the breakfast menu, it is necessary to use judgment in their care. When the cereal is sealed in a box at the factory it is protected from dust and from the troublesome little insects that sometimes molest grain; but when the box is opened the cereal may be contaminated in either of these ways. Corn-meal and wheat are more especially subject to mold, which increases and grows rapidly in a damp, close place. When a box of cereal or grain is opened it should be emptied at once into a tightly closed jar of some sort.

To sum up the question briefly, we cook cereals to soften and break the cell-wall surrounding the starch, liberate the starch grain, and make it soluble, and so more easily digested. To this end we serve cereals stiff enough to chew, so that the

saliva may be mixed with them and the digestion of the starch started. If cereals are served in semi-liquid form, we cook them longer in order to make up in part for the shorter stay in the mouth. When the cereal is not thoroughly cooked it is difficult for the digestive juices to penetrate the raw starch, and so the body gets less heat and energy from it. It is, moreover, unnecessarily taxed to get rid of the undigested substance, which, before it can be eliminated, may cause intestinal irritation, resulting in peevishness and bad temper. Therefore, let us cook our cereals well and be amiable.

TABLE FOR COOKING CEREALS

Cereals	Quantity	Water	Salt	Time
Oats, coarse . . Steamed cooked Rolled Oats . . H-O . . . . Quaker Oats . .	1 c.	4 c.	1½ tsp.	4 hrs.
Steamed cooked Wheat . . . Pettijohns . . Old Grist Mill .	1 c.	1¼ c.	½ tsp.	20 min.
Cream of Wheat	1 c.	4 c.	1½ tsp.	45 min.
Corn . . . . Indian meal . .	1 c.	3½ to 4c.	1½ tsp.	3 to 4 hrs.
Wheatena . .				30 min.
Hominy . . .				1 hr.
Rice, steamed .	1 c.	3 c.	1½ tsp.	45 to 60 min.
Rice, boiled . .	1 c.	2 qts.	1 tsp.	30 min.

CEREALS

	AMOUNT UNCOOKED YIELDING 100 CAL.		PERCENTAGES OF				ORDINARY SERVING ⅝ TABLESPOONFULS COOKED CEREAL		
	Gms	Approx. Measure	Protein	Carbohydrate	Fat	Mineral Matter	Calories	Amt. Raw Cereal to Give 5 tab. Cooked	Cost
Barley . .	28	2 tab.	8.5	77.8	1.1	1.1	50	1 tab.	.002
Corn meal .	28.1	2½ tab.	9.2	75.4	1.9	1.0	72	1½ tab.	.003+
Farina . .	27.6	2½ tab.	11.0	76.3	1.4	0.4	63	1½ tab.	.002—
Macaroni .	28.0	6½ sticks 1 ft. long	13.4	74.1	0.9	1.3	100	6½ sticks	.003
Oatmeal .	25.0	5 tab.	16.1	67.5	7.2	1.9	56	3 tab.	.002+
Rice . . .	29.5	2 tab.	8.0	79.0	0.3	0.4	100	2 tab.	.004
Shredded Wheat	27.4	1 biscuit	10.5	77.9	1.4	2.1	100	1 biscuit	.01
Zwieback .	23.1	3 pieces	9.8	73.5	9.9	1.0	100	3 pieces	.012

IV

BREAD AND YEAST

NOTHING on the table so insures the health and contentment of the family as good bread. There is no article of food about which there has been more written, more instruction given, or in which more failures have been made. Nothing adds more distinction to a table than good bread or breads, and it is almost safe to say that nothing is so rare.

Many a housekeeper noted for her good cooking has complained that she could not understand why she never could have really good home-made bread. She has tried many recipes, followed them closely, but achieved only a commonplace loaf with a thick, hard crust; and as for rolls! She has wasted eggs, butter, and patience so often as to be in despair. The best advice to the housekeeper desiring good home-made bread and rolls is to try first to make perfect bread, light, white, crisp, and thin-crusted. When the fine loaf is achieved the rolls will follow.

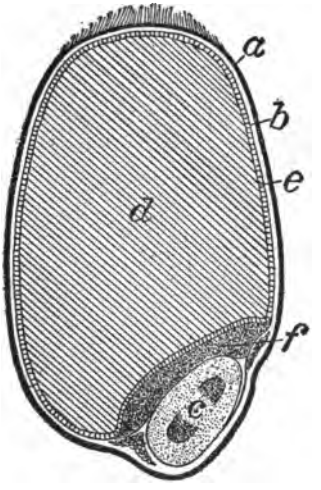
To secure that rarest thing, a perfect loaf of home-made bread, what conditions are to be

insured? How many are vital to success? First, the flour must be excellent; second, the yeast perfect; third, the quantity of salt and liquid must be exact; fourth, the mixing and kneading must be performed with judgment; fifth, the time and temperature allowed for rising must be just right; sixth, the baking must be thorough. Some other foods may be made by any one who has wit enough to put certain quantities of needed material together. To achieve a perfect loaf of bread certainly calls for intelligence, judgment, and practice.

Flour. The selection of a good bread-flour is the first essential. A good standard bread-flour is more easily procured now than formerly. In many parts of the country there are two crops of wheat, spring wheat and winter wheat. The flours made from these wheats show marked differences. That made from wheat harvested in the early summer is known as winter wheat, is white in color, has a soft and powdery feel, and contains a larger quantity of starch than the spring wheat. Winter wheat, if used alone, makes the best flour for cake, quick breads, and pastry. Spring wheat makes a cream-white flour, with a granular feel, and will absorb more water than winter-wheat flour. Spring wheat if used alone makes the best flour for bread. Spring-wheat flour is often called a strong, hard flour, and winter wheat is known as a soft flour.

However, the average housekeeper does not

need to keep this distinction in mind if she buys the regular brands of household flour from one of the big mills. The modern miller aims to produce a good flour of even quality, and in order to do this mixes spring wheat and winter wheat and the wheats of wet and dry seasons in carefully calculated proportions. This flour is good for yeast bread, quick breads, and pastry.



DIAGRAMMATIC SECTION OF A GRAIN OF WHEAT

a, Skin and testa; *b*, membrane; *c*, embryo; *d*, flour cells; *e*, cereal or aleurone layer; *f*, scutellum.

All of the wheat kernel is not used in ordinary white flour. The outer husk and germ are removed after the first grinding of the grain, and what is left passes between many steel rollers and through many sieves until the flour is reduced to the desired fineness. A paste of water and wheat flour has an elastic quality not found in a dough made from flour of other grains. It is very tenacious, and grows more elastic as it is worked in the hands. The elastic or tenacious

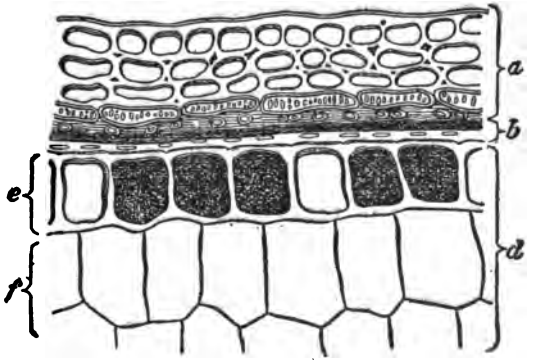
characteristic is due to the protein constituent called gluten. The millers call a flour strong or weak as it contains more or less gluten. The wheat grain also contains a large proportion of starch, some fat, and mineral matter.

An examination of the enlarged wheat germ may interest the housekeeper who desires to understand the character of the different flours made from the wheat grain. (See illustrations.)

The best bread is made from a strong flour—one rich in gluten. A good bread flour is cream-white in color, and it should not feel too soft and velvety; when squeezed in the hand it falls apart as the hand is opened, not caking together as does the weaker flour that has less gluten. A good bread flour, when wet with water, makes an elastic, tenacious dough. The degree of elasticity of the dough is one of the tests used by the miller for flour. When a given flour does not come up to standard in this respect he mixes it with a strong flour until a correct blend is reached—one making dough showing a correct degree of elasticity. There are many tests used to determine a good bread flour. The best one is that it will make good bread. This baking test is always used by large bakeries and by the most reliable millers.

The discussion of whole-wheat flour and flour made from other grains will be considered after the directions for making a simple loaf of white bread are given.

Yeast. Having procured a good bread flour, the quality of the yeast must be considered. Here again the manufacturer has taken much of the responsibility from the bread-maker. The compressed and dried yeast cakes on the market are well made and reliable, and keep up to a standard of excellence only equaled by the standard achieved for bread flour by the best millers.



CELLULAR STRUCTURE OF A GRAIN OF WHEAT
(After Winton and Moeller)

a, b, Two outer layers of the bran; *e,* rectangular cells (cereal or aleurone layer); *f,* irregular cells (the floury portion of the endosperm).

In using compressed yeast it is essential that it be fresh. This can be determined by the smell. It should have the characteristic yeast smell, not a cheesy smell. A compressed yeast cake that is fresh breaks with an uneven edge; where the edge is even and smooth as though cut the cake

is stale. The dried yeast has the great advantage of keeping fresh under ordinary conditions of temperature. It requires a longer time to work. The dough must stand longer when dry yeast is used, but this slower action of the yeast produces a bread of more delicious flavor. Very few housekeepers now use home-made yeast, and it will not be discussed here. The home-made yeast, of necessity, varies in character.

Yeast is a tiny one-cell plant which grows in the flour and water, producing carbon dioxide, a gas which pushes up the dough in its efforts to escape. Yeast plants are in the air; it is one kind which gets in the cracks of the fruit-jars and spoils the preserves. Home-made yeast is apt to have some of these wild yeast plants, which may develop unpleasant flavor in the bread, and are undoubtedly the bad fairies who played havoc with the bread of the early settlers.

Preparation. With a good bread flour and a fresh yeast cake, the bread-maker's attention is given to the physical condition of her mixing-bowl, kitchen, and person. Cleanliness is desired by every one; absolute cleanliness is a requirement to produce the perfect loaf of bread. The cleanliness of the hospital should be striven for, which means not only freedom from dust and dirt we can see, but the security from all foreign matter in the utensils. This can be insured only by immersing the bowl, spoon, and measuring-cup in boiling water.

The cook should wear a fresh-laundered cotton dress or a fresh apron which covers the dress, so that no dust may fall in the dough. The hair of the cook is better covered; in any case, it must be so arranged that it will not shake dust into the dough. The hands and nails of the cook should be cleansed as carefully as the trained nurse's are before an operation. The reader is, perhaps, objecting that few cooks carry out these minute directions. The reader is answered that few cooks make perfect bread.

The only necessary ingredients to make bread are flour, salt, yeast, and liquid. Whether the liquid is water or milk is purely a matter of taste. The difference in food value of milk and water bread will be discussed later in the chapter. Since the exact proportions of flour, water, salt, and yeast to make bread can be procured from any cook-book, only general proportions and the essential conditions to be observed will be given here. The usual blend of family bread flour as found on the market to-day will take about one-fourth its volume in liquid; that is, to four cups of flour add one cup of liquid, and one teaspoonful salt. (Modern recipes in giving measurements of flour always mean level measures of flour that has been sifted once.)

The quantity of yeast varies with the time given it to do its work. The work of the yeast is to act on the starch in the flour, and by changing it into sugar, then into carbon-dioxide gas and alcohol, to

make the dough light. The bubbles all over and through well-risen dough are the evidences of carbon-dioxide gas trying to escape. One-eighth of the usual compressed yeast cake to four cups of flour is a good proportion. This proportion of yeast will take six or seven hours to rise—that is, to double the bulk of the dough. The smaller the quantity of yeast and the longer the time allowed for rising, the sweeter, better-flavored will be the bread. The advocates of the larger quantity of yeast and quicker rising of the dough contend that there is less danger of contamination because the bread is made in a shorter time.

It is perfectly possible to observe such cleanliness in the room where the bread is made that there can be no contamination, so that this is not a valid argument for quick rising. Another very important condition to observe is the temperature of the dough while it is rising. It should be kept at an even temperature, about 90° to 95° F.—or, in ordinary terms, warm. If too hot the yeast is killed and no action results; if too cool the yeast will not grow, and again there is no action, which means that the bread does not rise.

There are two accepted methods of making bread. One is to make a thin batter, add the yeast, allow to rise, then add the rest of the flour, knead thoroughly, allow to rise again, and bake. The other method is to use all the liquid and flour in the original mixture, knead it, set to

rise, knead slightly, form in loaves, set to rise the second time, and bake. Either way will make equally good bread when absolute cleanliness, even, warm temperature, thorough kneading, rising to the correct point, and thorough baking are observed.

A number of bread-making machines are on the market. They are excellent, doing the work well and efficiently. The machines are no more difficult to clean than is any bowl in which bread would be made. Any utensil must be carefully and intelligently cleaned. The machines save time, as the time of turning the machine is much less than the time for kneading by hand.

Baking. The necessity for thorough baking of bread cannot be overestimated. Underdone bread is the cause of more than half the dyspepsia in the land. The oven should be hot enough to brown in three minutes one-half teaspoonful of flour scattered on the oven floor, or—a tidier test—when a piece of white writing-paper turns dark-brown in six minutes. A commercial baker gives the following rule for baking bread: "When the bread is nearly ready to bake, heat the oven to 440° F., open the oven door and cool to 300° F. before putting the bread in the oven. After the bread is put in the oven leave the door open for ten minutes. During this time the bread rises. At the end of the ten minutes close the oven door and bake in a heat increasing to 390° F." Mrs. Rorer says to put the ordinary loaf of bread in at

280° F. If the shallow French bread-pans are used, 360° F. Many people forget the quick cooling of the oven when the door is left open. In the newer ovens with glass doors the baker can watch the loaf brown without cooling the oven by opening the door.

To follow these directions an oven-thermometer is necessary. Indeed, this is a great help in every baking operation. It takes long experience to judge correctly oven temperatures by feeling, and even the seasoned housekeeper is misled by a new stove. The thermometer always tells the right temperature irrespective of the kind of oven it is used in. The reasons for difference in exact directions for baking bread are probably due to the fact that oven-thermometers are not carefully standardized. The exactness of the reading of the thermometer is also important. An ordinary loaf of bread must remain in the oven forty minutes with the oven door closed. If there is danger of burning, the oven door may be opened and the bread left in the oven another fifteen minutes. An old English expression surviving in the South is to "soak the loaf," meaning to soak it with heat. The heat must penetrate to the center of the loaf and kill all yeast plants. Any live yeast plants which find their way to the human stomach will continue to live, producing carbon-dioxide gas. The result of the yeast action in the stomach is the inflated feeling so well known to sufferers of dyspepsia. A test

for well-baked bread is to roll the crumb between the thumb and forefinger; if it crumbs, the bread is well baked; if a pasty ball is the result, the bread is underdone.

When the loaf of bread comes from the oven it should be set on a rack or other arrangement so that the air can circulate all around the loaf. This should be in a dust-free room. This exposure of the bread to the air aids in the escape of all gas and steam. When the bread is cool it should be put away where no dust can penetrate. A tin box kept expressly for this purpose is very good. The practice of wrapping the bread in a cloth is not a good one. It is almost impossible to keep such a cloth absolutely clean. Not only may it cause the bread to "taste of cloth," but the conditions for the growth and cultivation of mold are greatly increased. The bread-box, if one is used, should be scalded out every other day, and exposed to the direct rays of the sun. Old pieces of bread should not be kept in the same box with the fresh bread.

Variations. Most people like bread made with shortening. Fat may be added in the proportion preferred. Sugar, eggs, nuts, and spices can also be added to bread as taste dictates. French bread is made with water and no shortening. Milk improves the keeping quality of the bread, makes a more tender crumb, affects the color of the crust. Water gives the better flavor. Butter or other shortening also prevents the drying of

the bread and makes it more tender. Two teaspoonfuls of shortening to three cups of flour (the ordinary loaf) is a good average proportion, although some families like bread made with as much as two tablespoonfuls to the loaf.

Salt checks the action of the yeast. In summer, particularly by the sea, where the yeast grows more quickly, a larger quantity of salt may be used to retard the rising. More than one teaspoonful of salt to a loaf will make the crumb less tender and affect the color of the crust. Sugar has the opposite effect of salt upon yeast. It makes the yeast work more quickly. When quick-process bread is made, sugar is always used—about two teaspoonfuls of sugar to one loaf of bread gives the best result. Some people brush over the freshly baked loaf with butter. This detracts from the crispness of the crust, softening it. If great care is not exercised, more butter is used than can be absorbed, and this leaves the loaves greasy and unattractive.

Bread made with milk and shortening will have a somewhat higher nutritive value than that made with water. It should be remembered, however, that the nutritive value of bread, as of other foods, must be measured by digestibility as well as by chemical composition. The digestibility of bread depends largely upon the lightness of the loaf and the thoroughness of the baking. Well-made, well-baked bread is one of the most wholesome economical foods. Eaten as it is with butter, it

gives to the body all the necessary food principles. Well-made white bread is probably the cheapest food possible.

The much exploited bread made from whole-wheat flour has its place and use for some people. It illustrates very graphically the importance of judging a food by its digestibility rather than by chemical analysis alone. The flour made from the whole grain of the wheat contains considerably more protein and mineral matter. From the chemist's point of view it offers a greater return than does the white flour. However, repeated experiments with people go to show that the body gets more nutritive value from an equal amount of white flour than from the same amount of whole-wheat flour. Moreover, to quote from the United States Experiment Station Bulletin No. 85, which gives the results of studies of white and whole-wheat flour: "While composition, digestibility, and palatability of a food are important factors in determining its value, the cost or comparative pecuniary value also require consideration."

Graham and entire-wheat flour usually sell at a higher price than white or ordinary bread flour. Since the white, straight-grade flour contains somewhat more digestible nutrients than Graham or entire wheat, it will be seen that for a given sum of money white flour furnishes the largest amount of nutrient and available energy. The wise housekeeper will use as many varieties of

bread as possible to give interest and change to her daily food—Graham, whole-wheat, and rye breads can be served in place of the white bread once or twice a week, or at certain meals.

Baker's Bread. The comparison of home-made and baker's bread is difficult, because the home-made product is so uncertain a factor. Experience will give approval to the statement that the well-made home-made loaf of bread goes further and satisfies the family better than a loaf of baker's bread of the same size. In some recent experiments with bread-making, where gas was the fuel for baking, the following figures were obtained: A loaf of bread made of 1 cup of milk, 4 cups of flour, 1 tablespoonful of butter, 1 tablespoonful of sugar, 1/8 yeast cake, cost 8½ cents (including cost of gas) and weighed 23 ounces. When water was used in place of milk and Crisco instead of butter, the cost was 5¼ cents, and the weight of the loaf 26 ounces. A baker's five-cent loaf of bread weighs but 12 ounces. This is a distinct saving in money, and the result is more palatable and often more nutritious. When the bread made at home is baked in a coal-stove it further reduces the cost of the loaf, because the fire is used to cook other things.

Bread-making takes considerable time, and it is true for many housekeepers that their time may be more profitably spent in other ways, but only true when really good baker's bread can be procured. If it is an economy to buy baker's bread,

for the safety of the family it must be bought where the factory is open to the inspection of the public. While many bread-factories are examples of cleanliness and perfect sanitation, this is by no means the general rule.

The movement requiring that baker's bread be wrapped in paper at the factory is a necessary sanitary precaution. It increases the cost of the bread slightly, but cleanliness is always worth paying for. A story is told of a Bakers' Convention where a motion was made that all bread be wrapped in paper. It was opposed by an old baker, who arose and said: "It will not work. Years ago we tried wrapping loaves of bread, but the paper got so dirty no one would buy the bread." He did not state what happened to the unwrapped bread.

Rolls. The cook who has mastered the art of bread-making finds that she has at the same time acquired the essentials for making rolls and raised biscuit. Very delicious rolls can be made by taking some of the bread-dough, adding eggs and butter to it (consult a cook-book for proportions, which vary), allowing to rise, then rolling out to about one-half-inch thickness, cutting with a biscuit-cutter, and putting into a pan to rise again. When light (if Parker House rolls are wanted), the risen pieces of dough are rolled, brushed over with melted butter, folded, and baked. Parker House rolls must be folded parallel or they will unfold during the baking. Any

shaped roll can be made—bread-sticks for dinner or clover leaves for luncheon. If hot rolls are liked, it is a simple matter to set the pan of risen rolls in the refrigerator until time to bake them. The cold simply retards the growth of the yeast, and will not injure the flavor or texture of the rolls.

The skill to make a perfect loaf of bread does not come for the wish. Much practice is needed to acquire the art. The woman of to-day should never forget that the word "lady" means "loaf-giver," and that the providing of perfect bread for her family is one of the oldest, highest, and pleasantest duties of the home-maker.

V

QUICK BREAD AND GRIDDLE-CAKES

TO many housekeepers the conditions contributing to the making of delicious quick bread are of more immediate interest than is the making of yeast bread. Good yeast bread can be procured from the public baker, while the tea-biscuits, muffins, waffles, and griddle-cakes must be made at home. The mixtures included under quick bread vary all the way from the thin batter of which griddle-cakes are made to the dough of which a very delicious loaf of bread is made. These batters and doughs are dependent for their lightness upon various leavens, the most common being baking-powder, and soda in combination with some acid substance, such as sour milk, molasses, or cream of tartar.

Baking-powder. All baking-powders are made of two materials—sodium bicarbonate, more commonly called "soda," and some acid substance. When the soda and the acid substance used are combined, if there is any moisture present—even the slight amount of moisture from the air—a gas (carbon dioxide) is given off. A "filler,"

which is either corn-starch or flour, is used to separate the particles of soda and the acid substance. The more filler used the less carbon dioxide is given off. Inexpensive baking-powders often have a great deal of "filler." All ingredients should be dry before combining, and in order to prevent absorption of moisture baking-powder should be kept in closely covered tin or glass jars.

Types of Baking-powder. The baking-powders are classified according to the kind of acid substance with which the soda is combined. No matter what acid substance is used, carbon-dioxide gas is given off and water is formed. Besides these, another substance called a residue is left in the mixture. The nature of the residue depends upon the kind of acid substance used. The claim is often made that the residue from certain kinds of baking-powders is not wholesome. These assertions are made upon the chemist's analysis rather than upon the doctor's observation. This is one of the many questions that need to be settled by a number of experiments upon a number of people for a long period of time.

In a tartrate baking-powder, cream of tartar (potassium acid tartrate) is the acid substance combined with the soda. Cream of tartar is obtained from a deposit found on the bottom and sides of wine-casks. This deposit is ground, dissolved in boiling water, bleached, purified, and

recrystallized, in which form it is called cream of tartar. The supply is naturally limited.

Soda, which is mined from the earth or made from certain sea products, is shipped in great quantities from Greenland. Bicarbonate of soda is obtained by treating a solution of carbonate of soda with carbonic-acid gas. The usual recipe for making a tartrate baking-powder is as follows:

1 lb. 2 oz. cream of tartar
½ lb. soda
¼–½ lb. starch

Many large hotels and restaurants manufacture their own baking-powder, so that they may get a pure compound at a minimum cost. Whether or not this is advisable for the housekeeper is a debated question and depends largely upon what value she puts upon her time. To insure the keeping of baking-powder the ingredients must be thoroughly dried. It is easy enough to dry starch or flour and the cream of tartar; but a very little heat causes the soda to give off carbon dioxide, under which circumstances it loses its value as an ingredient of baking-powder.

It is a simple matter to compute the cost of a tartrate baking-powder so that each housekeeper can judge whether she wishes to be her own manufacturer. Prices vary for both cream of tartar and soda, depending upon the grade desired, the quantity bought, and the store selling them. Cut-rate drug stores frequently offer a

perfectly reliable article at a low price as a leader; but bargain sales are safe only to the one who can test for a pure article.

Assuming that cream of tartar is 40 cents a pound and soda 20 cents a pound, these being average prices, a pound of tartrate baking-powder would cost about 28 cents, which is a saving of from 14 cents to 22 cents a pound over the commercial product.

The residue left from tartrate baking-powder is Rochelle salts. It has been estimated that a large loaf of bread contains forty-five grains more of Rochelle salts than are found in one Seidlitz powder, but, as no one ever eats a loaf of bread at once or seldom in one day, the effect of the Rochelle salts upon the body is scarcely worth considering.

Examples of tartrate baking-powder are: Royal, Price's, Cleveland, and Sea Foam.

The phosphate baking-powders have acid phosphate of lime combined with soda. The action of the phosphate baking-powder is brought about like that of the tartrate baking-powder—by heat and moisture. Carbon dioxide is the leaven, and the residue in this case is phosphate of calcium and sodium.

The manufacturers of phosphate baking-powders argue that the phosphate residue supplies to the body the phosphate lost in the milling of the flour. As the phosphate is not in the same form as it is in the wheat grain, this is not a

logical argument, since the body cannot make use of it in the same way. Perhaps the greatest fault with the phosphate baking-powders is the fact that they do not keep well. The best-known phosphate baking-powder is Rumford's.

In alum baking-powders the acid substances most commonly used are potash, soda, and ammonia alums. There has been much question by chemists as to the possible harmfulness of the residues of alum baking-powder. The theory has been that they cause more or less irritation to the digestive tract. Recently, however, a report of the Referee Board of Consulting Scientific Experts, published by the United States Department of Agriculture, April, 1914, states that no more harm has come from the use of alum baking-powder than from any other kind. The cheapness of alum baking-powders is a great point in their favor.

Since all manufacturers are required by law to state plainly on the label what is contained in the baking-powder, each housekeeper can be her own judge as to which she wishes to use. The housekeeper selects the baking-powder according to the amount of gas it gives off, as this determines the lightness of the mixture. Examples of alum baking-powders are: Calumet, Davis, and Atlantic and Pacific.

Many baking-powders on the market are made only in certain communities and cannot be found far from these localities, or sometimes a manu-

facturer sends out the same product under different names. If the housekeeper does not wish to trust the manufacturer's label in this case, she can send a sample of the baking-powder to the State chemist, who will analyze it and give her accurate information regarding it.

Other Leavens. In every flour mixture the lightness is partly controlled by the steam and air. As the air is heated it expands and carries the mixture with it. This is true when the air is beaten into the mixture itself or beaten into eggs used in the mixture. The forming of steam from the water or milk used also helps to lighten the flour mixture, unless a hard crust is formed too soon in baking. If this happens, the steam cannot escape, and as the mass cools it condenses, making a sticky, dough-like substance.

The use of soda with sour milk produces carbon dioxide. The acid of the milk reacts with the soda, as does the acid substance used in the various baking-powders. Since the soda reacts as soon as it is moist, it is better in making a flour mixture to sift the soda with the flour and add the milk just before the mixture is to be heated. Heat hastens the generating of the gas.

It is difficult to give accurate proportions for sour milk and soda, as the amount of acid in the milk varies. Usually a half-teaspoonful of soda is sufficient to neutralize a cup of sour milk. It is even more difficult to give a definite proportion for soda combined with molasses. Molasses

made in the old-fashioned way as a by-product in the manufacture of cane sugar was strongly acid, and usually required a teaspoonful of soda to each cupful. The molasses now on the market is made mostly of glucose, brown sugar, and coloring matter, and flavored sometimes with molasses, but more often there is none in the combination. This imitation molasses has very little acid in it. As is stated on the label, a small quantity of sulphur dioxide is usually added to prevent fermentation. This probably becomes an acid in the mixture and reacts with the soda. Such molasses is so uncertain a product that it is difficult to state a definite proportion of soda to use with it.

Ingredients. There are but few ingredients used in hot breads—in fact, only four that are essential—flour, liquid, salt, and leaven. The flavor and the character of the mixture are varied according to the consistency of the mixture and the addition of a few accessories.

The most common accessories are shortening, eggs, sugar, and others that might be classed as flavors, such as spices, fruit, and flavoring extracts. The consistency of the mixtures, too, may be classified—a thin batter has equal parts of flour and liquid, a thick batter has one part of liquid to two parts of flour, and a dough usually has three parts of flour to one part of liquid. Pastry, the stiffest dough, has four parts of flour to one part or less of water.

Types of Hot Bread. If the inexperienced housekeeper were to realize that the character of any hot bread depends upon the manner in which it is subjected to the heat and the consistency of the dough rather than upon the ingredients combined, perhaps the art of cooking might be simpler. There are certain proportions that for ordinary purposes are definite enough to remember. Two level teaspoonfuls of baking-powder are usually used to one cup of flour, and one-fourth level teaspoonful of salt to one cup of flour. Knowing these proportions and the variations of flour and liquid to make the range of mixtures from thin batters to dough, the cook has a working basis for any recipe.

As has been said before, in modern recipes it is always understood that the flour is sifted before measuring. Under no circumstances should the flour be shaken down into the measuring-cup. The method for putting together all batters and doughs starts the same—mix and sift the dry ingredients. This distributes the salt and baking-powder or soda uniformly throughout the flour, and insures an even rising. Corn meal, Graham flour, whole wheat, bread-crumbs, and cooked cereals may be substituted for any portion of the white flour. Sugar and spices may be added as part of the dry ingredients. When a coarse, dry ingredient will not go through the sifter, it is added after the finer ones are mixed by sifting.

By adding the dry to the liquid ingredients,

time and dishes are saved. The liquids may be all or part milk, water, eggs, molasses, or melted butter. When the dry and liquid ingredients are combined in this way, the mixture needs to be beaten vigorously to inclose as much air as possible. No matter what the leaven, a lighter substance will be obtained if a good deal of air is beaten into the batter. Much air can be beaten into a thin batter with a Dover egg-beater, if the use of that is less tiring than the use of a spoon.

There are several variations in the method of combining the liquid ingredients. Sometimes to obtain a lighter mixture the egg yolks and whites are beaten separately, and the whites folded into the mixture just before it is put into the oven. This is done when making pop-overs, and usually when making waffles.

Waffles contain either baking-powder and sweet milk or soda and sour milk, both of which, it will be remembered, give off carbon dioxide when subjected to heat and moisture. One-half cup of batter is needed to fill an ordinary waffle-iron, but when the egg-whites are folded in last it takes less batter to fill the iron. The latter kind of waffles must necessarily be lighter and more crisp.

In the pop-over batter the "popping over" is due entirely to steam and the expanding of the air inclosed in the well-beaten eggs; therefore this mixture should be put into hot pans and into a

hot oven, and the door kept closed until the mixture has a firm enough crust to keep its shape when the oven door is opened. Unless the walls are firm a blast of cold air causes the mixture to fall. An ideal pop-over should be hollow inside, and crisp and well baked throughout. These served with sugar or syrup, or filled with a custard or blanc mange, make an excellent dessert.

Griddle-cakes may be made with sweet milk and baking-powder or sour milk and soda. They are baked on a griddle hot enough to form bubbles almost at once. This means that the heat is great enough to cause the leaven to act. The cake should be baked completely on one side before it is turned. If it is turned back and forth on the griddle, the carbon dioxide cannot force the hard-baked crust to rise, and the cake will be heavy and indigestible.

French griddle-cakes make a delicious luncheon or supper dish. These are griddle-cakes the size of a dinner plate piled one on top of the other with butter and sugar or jelly spread between. Another variation is a German roll. This is a large or small griddle-cake spread with butter and jelly or sugar and then rolled.

Many housekeepers use left-over griddle-cakes by cutting them in fine pieces and adding them to the next griddle-cake batter.

Buckwheat cakes, generally considered a New England specialty, are popular throughout the United States. These may be made with baking-

powder, but are much better if made with yeast. Once the batter is started, about a cup of batter is saved from day to day to be used instead of yeast to set the next mixing.

Another article made from thin batters is fritters. Fritters are made by combining the four essentials—flour, liquid, salt, and leaven—and adding whatever either taste or pocket-book suggests. Eggs may be added, and sugar and fruit if desired. Fritters are fried in deep fat—a method of cooking which is usually thought to produce an indigestible substance.

It takes experience to cook with deep fat and have the article cooked throughout. Here are the rules for deep-fat frying: When the fat begins to smoke drop in an inch cube of bread. If it is a golden brown in forty seconds the fat is the right temperature for frying a cooked mixture. If an uncooked mixture is to be used, allow one minute for the bread to brown. This rule was in use before the manufacture of cooking-fats. If a manufactured product is used for deep-fat frying, by all means use a thermometer, and follow the temperatures the makers advise, as some of these fats decompose when they are hot enough to smoke.

Muffins, made from a thicker batter, contain the four ingredients in the proportion of two cups of flour to one cup of liquid, with the other two essentials varied accordingly. The accessories—melted butter, sugar, and eggs—may be added

to suit the taste. Many kinds of muffins can be made from the same recipe, substituting for one-half of the white flour corn meal, whole wheat, rye, Graham, rice, or any of the cereals. Fruit may also be added to a muffin batter, a cup of fruit to a mixture made of two cups of flour. If the fruit is juicy, the amount of liquid in the recipe must be reduced. Muffins are delicious when split, toasted, and served hot.

The quick breads made with a dough are mixed in a different manner from the batters. In a stiff mixture like baking-powder biscuits the shortening is cut into the flour and other dry ingredients, so the method begins the same—"mix and sift the dry ingredients," then "mix in the shortening." This may be done with the fingers, but a much better method is to cut it in with two knives. The liquid is added last, and after this the dough is handled lightly.

A very good baking-powder biscuit is made with a soft dough dropped into muffin-pans. This is called an "emergency biscuit," because it can be made very quickly. It is well to have in mind the proportions for baking-powder biscuits (2 teaspoonfuls baking-powder, ¼ teaspoonful salt, 1/3 cup of water, 1 to 2 tablespoonfuls shortening to 1 cup of flour), as this dough is the foundation for many good quick breads. Fruit-rolls, for example, are made by rolling this dough about one-quarter inch thick. Sprinkle this with sugar and cinnamon and raisins or currants. Roll

like a jelly-roll and cut in one-and-a-half-inch slices. Lay slices flat in the pan and bake as baking-powder biscuits are baked, in a hot oven. These are sometimes called pin-wheel biscuits. To make fruit-rolls richer, eggs are added. Baking-powder biscuits, like muffins, are particularly palatable split, toasted, and served hot.

Short-cake is a baking-powder biscuit mixture with a little more shortening added. Apple-cake is the baking-powder biscuit mixture to which an egg is sometimes added. The mixture is fitted into a cake-pan and sliced apples are spread over the dough, or set up overlapping one another. The top is sprinkled with sugar and crumbs of butter, and this is baked in a hot oven at first, then the heat decreased to be sure the mixture is baked and the apples cooked.

Another attractive dish made from this same combination is apple-dumpling. Cut the baking-powder biscuit mixture in about four-inch squares. Place on each square a medium-sized apple, pared and cored. Season the apple with sugar and butter, nutmeg or cinnamon, and fold the corners of the dough over the apple. Press them together and bake them in a pan in a medium-hot oven. These are sometimes baked in muffin-tins, in order to keep a better shape.

A very appetizing loaf of bread can be made with a baking-powder biscuit combination for a foundation. To this an egg and either nuts or fruit are usually added. This must be baked

about an hour in a medium oven, or it will not be well baked throughout the loaf. This is equally delicious with sweet milk and baking-powder or sour milk and soda.

Place in Diet. The quick breads are the housewife's joy in an emergency. They are used very commonly in this country, especially in the South; but experience has taught many people to shun them. The difficulty seems to be that unless the hot bread is remarkably flaky it forms a somewhat pasty mass, which it is difficult for the digestive juices to penetrate.

While it is generally admitted that most adults suffer no inconvenience from eating *well-cooked* hot breads, they should not form a part of the children's diet, as there is too great temptation to swallow them quickly. Dry bread, toast, and zwieback, which must be well masticated before they can be swallowed, stay in the mouth long enough to be thoroughly mixed with saliva, the ferment which begins the digestion of starch. The rapid growth and active exercise of children demand that only nourishing and easily digested food be given, but they can be taught from early childhood not to expect to eat all the food the grown-ups enjoy. Indeed, unless they are so taught either the older members of the family must restrict their diet unnecessarily or the children will be undervitalized from improper food.

VI

CAKES

IN ordering a luncheon for some guests recently, a hostess gave this parting injunction: "Have everything delicious, but be sure the cakes are especially nice, as they are served last and will remain longest in the minds of the guests." If this is true, it behooves every housewife to study diligently the "whys" and "hows" of cake-making.

Cake-making is not a hit-or-miss affair, but a process depending upon (1) the use of good materials, (2) the selection of suitable utensils, (3) skilful manipulation, and (4) a well-regulated oven. When any one of these factors is disregarded a good cake may be "hit" upon occasionally, but more often it is "missed."

Before beginning to bake a cake all materials should be collected, the pans prepared, and the oven tested. The preparation includes selecting the pans, a bowl suitable for mixing, a measuring-cup, a mixing-spoon, a teaspoon, a knife, and a flat pan or dish to hold the soiled utensils. Then the ingredients to be combined in the cake are

arranged on the table in convenient order. The eggs must be washed before the cook begins to handle the ingredients for the cake. The pans are prepared by being heated slightly and greased with butter, or, better still, some other fat. Some housekeepers prefer a fat other than butter, as butter burns at a low temperature and gives the cake a burned appearance. Moreover, with butter at forty cents a pound or thereabouts, it is more economical to use another fat. A brush may be used to grease a pan, but this is difficult to keep clean, and therefore is to be condemned. A piece of oiled paper or unglazed paper is just as good and much more sanitary. A roll of the modern sanitary paper toweling hung in the kitchen provides paper for this and many other purposes.

It is usually better to dust the bottom and sides of the pan with flour, as the dry, loose particles of flour keep the cake from sticking. Therefore when the pan is inverted the cake drops out readily. The pans being ready, it is time to give attention to the oven.

The Oven. Oven tests without a thermometer are very indefinite and unsatisfactory, and almost as unsatisfactory with the ordinary thermometer, because, as has already been said, the thermometer for the household has not been standardized and is not entirely reliable. Loaf cakes, chocolate cakes, or those containing molasses, require a slow oven. A layer cake needs a quicker

oven. But how an inexperienced housekeeper is to know the difference between "slow" and "quick" is a puzzle. Our inability to give her definite and reliable directions shows how indefinite and unreliable much of the business of housekeeping is even yet, and how much need there is for household "science." When science is applied in the household as effectively as it is in some of the great modern industries, the household will save time, labor, and money, just as the industries have. Until then we can only take advantage of every bit of applied science that is available.

The temperature at which to bake a cake, then, is very indefinite, and this is probably the reason for so many failures. Some housekeepers call a moderate oven one in which they can hold their hand without discomfort while they count ten. That is not satisfactory, since one person can endure much more heat than another. Another test is to put a piece of manila paper in the oven. When the paper is light-brown the temperature of the oven is medium or "moderate."

These and similar tests are adequate for the person whom experience has taught to be an accurate judge, but how to hand this information along to the inexperienced is difficult to know. Until some manufacturer fills a long-felt need by an accurate, well-constructed oven thermometer this will remain an unsettled problem. Until that day each beginner must go on count-

ing ten and training her hand to know a "slow," "medium," or "hot" oven, or must learn to use the paper test.

To save being disappointed and wasting material it is always better to bake just a little of the cake batter in a small pan. This will show not only the condition of the oven, but the consistency of the batter. The disadvantage of this in a gas-oven is the cost of the gas; but this is not great, and may save a cake whose materials cost many times the extra gas.

Kinds of Cakes. In cakes the basic ingredients are the same as in all the simpler flour mixtures —flour, liquid, a few grains of salt to bring out flavor, and leaven. The accessories are sugar, eggs, shortening, and a variety of flavors—vanilla, chocolate, almond, molasses, spices, nuts, and fruit. The kind of cake depends upon the variation in the amount of accessories used—the number of eggs, the amount of sugar and butter, and the kind of flavoring.

There are two general classes of cakes, cakes with butter and cakes without butter. The two types are quite distinct in method of mixing, and somewhat different in ingredients.

The cakes with butter require baking-powder— or soda and an acid substance—while the cakes without butter are entirely dependent upon eggs for leaven. The butter cakes are mixed with milk or water; the other type have no liquid, unless the eggs are counted as such. The butter

cakes can be made with one egg or six, those without shortening have usually from six to twelve eggs.

Preparation. For all cakes it is better to use pastry flour and finely granulated sugar. Coarse sugar on dissolving usually makes a coarse cake. For all cakes, too, as for the other flour mixtures, the flour must be sifted once before measuring. Accurate measurements are most important, as even a small increase in flour or liquid may affect the consistency of the batter seriously. The cakes with butter are more easily handled, and are less likely to be failures than the cakes without butter. They are usually less expensive and more easily varied, and therefore more often made. These cakes, like the quick-process breads, depend for lightness upon the various leavens—air, steam, baking-powder, or soda and sour milk or molasses.

Because the soda in combination with an acid substance gives off carbon dioxide when moistened, the cake should be baked as soon as it is put together. If it must wait while the oven heats, the mixture should be put into a cold place, since, it will be remembered, heat hastens the liberation of the gas.

There are three ways of adding the eggs: the first is to add them unbeaten to the creamed sugar and butter; the second is to beat the whole eggs well before adding; the third is to beat yolks and whites separately, adding the well-

beaten yolks to the sugar and butter, and folding in the well-beaten whites after all other ingredients have been added. The last method is thought by many to make a lighter cake. If this method is followed care must be taken not to beat the cake after the egg-whites have been added, as the air-cells will be broken.

After the dry ingredients have been well mixed and sifted they should be added to the mixture alternating with the milk, so that the batter is kept thin, since beating a thick batter develops the gluten in the flour and makes a stiff cake instead of a light, fluffy one.

In this age of efficiency another method of cake-making has come into popularity—that of putting all ingredients into a bowl together and beating them well. No creaming of butter and no beating of egg yolks and whites separately. This is a saving not only of time but of dishes, and has given rise to the manufacture of a cake-mixer, for a description of which see Chapter XVIII.

If a housekeeper has one good, reliable, plain cake recipe she can make any kind of cake she wishes. For example, if she has a good, inexpensive cake with two eggs, by adding spices—usually sifting them with the dry ingredients—a good spice-cake can be made, of course without molasses. Another variation would be obtained by adding nuts. A cup of chopped nuts to an ordinary-sized cake converts the plain into a nut cake. Two squares of melted chocolate change

the plain cake to a chocolate cake. Substituting two egg-yolks for each egg used makes a yellow cake. By omitting the yolks and substituting two egg-whites for each whole egg, a white cake is produced.

More unusual still, omitting the eggs entirely will give a very palatable eggless cake that will gratify the longing for sweets at a less expense. If this cake is baked in layers, put together with jelly or custard and eaten the day it is made, it is a little economy worth practising occasionally. Such a batter can be used very successfully for a cottage pudding, as the sauce served with this covers up any lack of flavor.

Cakes with Fats other than Butter. When it is necessary to economize it is well to use another fat than butter. Some of the fats now on the market made from vegetable and nut oils are very successful substitutes for butter. Fresh chicken fat tried out makes a delicious cake, and in cakes flavored with molasses and spices it is possible to use fresh bacon fat if care is taken to omit the salt recommended in the recipe. Of course, the butter flavor is lacking in all these cakes, and the allowance of salt, flavoring, and spices must be increased on that account. If this is not done the cakes will taste flat.

In a recent experiment three plain cakes were made, one with butter, one with Wesson's Oil, and one with Crisco. The flavorings were increased in the last two, and eight people, some of them

teachers of cookery, were asked to tell which was the best of the three. They were not told which cake was which, and none of them could distinguish them. As a matter of fact, the larger number picked out the one with one of the "substitutes." If the family has a prejudice in favor of butter, it may be well to try a similar experiment on the family and see if the butter flavor is as real to them as they think.

Cakes without Butter. The cakes without butter —the angel, sponge, and sunshine cakes—require more skill than the butter cakes. For these cakes pastry flour must be used. This, too, must be sifted once before measuring, and after measuring must be sifted at least six times, to fill the flour with as much air as possible, making it light and airy to begin with.

Lemon-juice or cream of tartar is always added to such a cake because of the acidity, as the acid brings about more complete coagulation of the egg albumen. The sugar for these cakes should be extra fine granulated sugar, and this, too, should be sifted. Last of all the flour should be folded in lightly.

These cakes should be put into a cold or slightly heated oven, and the temperature gradually increased to medium. A large cake requires sixty or even seventy minutes to become thoroughly baked. A fireless cooker is excellent for baking these cakes. If the soapstones are heated for fifteen minutes, the cake will be a delicate

brown and baked throughout in fifty or sixty minutes.

It is better to make angel and sponge cakes in a pan with a tube in the center—usually called a Turk's-head. By this device a larger surface of the cake is exposed to the heat. This is always a safer pan for any large loaf-cake. When these cakes are removed from the oven or fireless cooker the pan should be turned upside down on the cake-cooler. The pan should not be taken away, but as the center cone projects it will allow the cake to come partly out of the pan. This prevents the cake from settling back upon itself, draws it away from the bottom more gently, and altogether insures a lighter cake.

Tests to Determine whether a Cake is Done. Experienced cake-makers have various tests to determine when a cake is done. One touches the top lightly with her finger, and if the dent made springs back quickly she knows the cake is done. If the dent remains, she knows the cake-batter is still too soft. Another housewife depends entirely upon a broom-splint or one of the modern tooth-picks. She thrusts one of these into the center of the cake, and if it is the least bit sticky when it is taken out she knows that the cake needs more baking. A box of tooth-picks is a rather necessary part of a kitchen equipment—not to be used as the name indicates, but for testing cake and similar uses. It is much more sanitary to use a tooth-pick than a broom splint, un-

less a wisp-broom is kept expressly for this purpose.

Icing. A boiled icing is usually the bane of the inexperienced cook's existence. She is never sure when it is going to "run" or stand in lumps. This is because the making of icing, like the oven temperature, is a matter of guess or experience.

This, however, can be definitely settled by means of a thermometer and all anxiety done away with. A cup of sugar and a half-cup of water is syrup enough for one egg-white. Cook the sugar and water until the sugar-thermometer indicates 238° Fahrenheit to 242° Fahrenheit. The exact degree on a particular thermometer must be determined by a few trials.

If it is impossible to have a sugar-thermometer in the kitchen equipment, the safest direction to follow is to cook the sugar and water together until the very first drop threads from a clean, cold spoon.

In making boiled icing there really is no need of anxiety, no matter what happens. If the icing is a little too hard a few drops of boiling water poured into it and beaten vigorously will remedy the defect. This can be repeated a number of times without spoiling the icing. If the icing is not cooked enough, the bowl may be set in a pan of boiling water, the water kept boiling, and the icing beaten constantly until it is firm enough to spread on the cake.

There are several points to notice in making a

smooth boiled icing. The first is to keep the sugar from crystallizing. Sugar forms crystals very easily, and if one crystal forms, others collect around it quickly. To prevent this a speck of cream of tartar is added, since this acid substance is known to hinder the crystallization of sugar.

Another way to prevent crystallization is to keep washing down from the sides of the pan any crystals which form there. This is done with a fork, the tines of which are wound with a piece of cheese-cloth. When the padded fork is not in use it must be kept in cold water. Another point to notice is that it is easier to recognize when the icing threads if a clean fork or spoon is used rather than one which has already been dipped into the icing.

The eggs to be used should be beaten just before the hot syrup is poured upon them, or they may separate. These must be beaten stiff, but not dry. If the egg-whites are too dry when the hot syrup is poured upon them, the icing will have a curdled appearance. If it is necessary to let them stand a few minutes, they should be beaten vigorously for a moment before adding the hot syrup. The syrup is added slowly, and beaten constantly, so that the egg is subjected to the heat gradually.

A boiled icing may be varied to suit the taste. For a chocolate icing three squares of melted chocolate may be added to a syrup made with

one and one-half cups of sugar. Marshmallows, liquid coffee, shredded cocoanut, chopped nuts, or fruit may be added, or the plain icing may be flavored with a few drops of vanilla, lemon, or almond extract, or orange-juice.

There is no reason why a cake should go without any icing if a boiled icing seems too formidable. There are many recipes for making icing with confectioners' or powdered sugar, and egg-whites or cream—either sweet or sour—or both egg-whites and cream.

Ornamental icing is usually made with egg-whites and confectioners' sugar, to which a little cream of tartar has been added. These ingredients are put into a bowl and beaten vigorously until the mixture will stand on the cake. Any kind of icing may be colored with a good vegetable color to help carry out the color scheme of a meal.

The place of cake in the diet is considered at the end of the next chapter. Its place on the family table is sufficiently important for the home-maker to give it a good deal of attention.

VII

PASTRY AND LITTLE CAKES

EVERY beginning cook has had a feeling of envy for the person she knew of in her youth who "could make a cherry-pie quick as a cat could wink its eye." Leaving out the cherries, if any one could make the pastry for the pie with that speed it would be delicious and flaky, for handling pastry quickly and lightly is one of the first requirements for a successful result. Add to this good material and ice-cold water and the pastry cook's reputation is made.

It is better to use pastry flour; and if either butter or lard is to be used, they should be firm and hard. If any of the commercial fats are substituted it is better to follow the suggestions given by the producers, as some of the fats are used somewhat soft. One-fourth of a cup of shortening to a cup of flour is as much as an inexperienced hand can blend well; but with more expert manipulation it is possible to use one-third of a cup of shortening to one cup of flour. Only enough water will be needed to hold the

mixture together. The more water used the tougher the pastry.

The best way to add shortening to the flour is to cut it in with two knives. To rub it in with the fingers is an old-fashioned method, but unless the hands keep cool — an almost impossible condition when rubbing them together—it is better to use the knives. Some cooks use baking-powder in pastry to make it more flaky. This seems to be an individual preference, as many cooks make just as crisp and flaky pastry without it.

After the pastry is made the variety of pies is as great as the variety of fruit in market or the cook's ingenuity in combining them. There is the pie with only a bottom crust filled with custard, pumpkin, lemon, orange, or cocoanut filling, and covered with méringue; or apples or peaches covered with whipped cream. There is that delicious combination made by filling a deep pie-plate with well-seasoned fruit and putting a top crust on that. Or there is the more familiar pie with a bottom and top crust.

When a top crust is put on a fruit-pie there is usually some device for the escape of the steam. This is sometimes provided for by pricking the top crust with a fork, or, if the cook is artistic, she sometimes arranges short slashes in a design. Another plan is to make no perforations in the cover, but to leave it free from the under crust and allow the steam to escape at the edges. This

method has the added advantage that it does away with the thick piece of pastry where the two edges are pinched together. A little practice enables one to make these "lid" pies as symmetrical and attractive as a pie needs to be.

When a pie is made of green apples it is particularly important that the apples should be well cooked. To insure this it is well to have no perforations in the upper crust and to fasten it securely over the lower one, so that the steaming of the apples will cook them more completely.

Puff-paste is so expensive and elaborate in preparation that if the housewife considers her time at all, it is cheaper to buy it. Directions for making are given in any cook-book.

Little Pies. It is often daintier and more attractive to serve pie and cake made in individual pans. These are especially pleasing to children, and more desirable at luncheons and for afternoon refreshments.

The little pies called tarts, tartlets, or fanchonettes have a variety of interesting possibilities. The shell is made by fitting a piece of pastry on an inverted muffin-tin or small cake-pan. The pastry should be perforated to allow the escape of the air between the tin and pastry. When this is baked the cup-shaped shell can be filled with fruit, custard, jelly, or conserve.

A lemon or orange tart is more attractive with a méringue. Méringue is sometimes a trifle disappointing, but if a little care is used it can be

made delicious. First, the eggs should be thoroughly chilled before they are beaten; second, the méringue should be put into a moderate oven. If a méringue is taken from the oven too soon the uncooked portion will liquefy and the partially cooked portion will settle. If a méringue is cooked too long, or at too high a temperature, it will be tough and will shrivel.

A dainty tart is made by placing in a pastry shell half of a large peach, filling the cavity of the peach with whipped cream, and garnishing it with a blanched almond. The joy of every child's heart is the old-fashioned tart with jelly. This is usually made with a ring of pastry placed upon a circular piece, leaving a good-sized space for a spoonful of delicious, quivering jelly.

Little Cakes. There are pans of so many shapes and sizes now upon the market for little cakes that, so far as form is concerned, there is nothing left to the ingenuity of the cook. There are hearts, diamonds, clubs, and spades; there are stars and crescents, oblong and round, pointed bottoms and rounding bottoms, fluted edges and straight edges, and so on until the purchaser is bewildered by the array. Perhaps she decides to go home to bake her cake in a large sheet, and cut it up in small squares, diamonds, or rectangles, icing each one so that none of her guests will suspect but that she has at least three sets of tins.

Any cake recipe can be used to make little cakes, and any variation used. A simple cup or

sponge cake baked in muffin-tins may be made more elaborate by cutting out the central portion of the top and filling this cavity with whipped cream or a rich custard. When this cake is iced the surprise is completely hidden.

Chocolate cakes with chocolate in the mixture, baked in small, oblong tins, are nicely varied by cutting out a portion of the center and filling it with orange-marmalade. The cake is then covered with chocolate icing.

Cookies. Cookies are more varied even than cakes. There are thin cookies and thick cookies, hard cookies and soft cookies, cookies with fruit and cookies with nuts and cookies with oatmeal. All of them should be baked in a medium oven, or there will be burned cookies. The old-fashioned cookies that took hours to roll out and bake are giving place to the drop cookies. These may be made with any recipe, to which nuts or fruit are added at pleasure. Possibly a little more flour may be needed for the rolled-out batter.

Care. Cake should be thoroughly cold before it is put away. A tight tin box is the best thing to keep it in; but it should be a box kept for this purpose only. If bread and cake are kept in the same box the cake absorbs the moisture and the bread is spoiled. For the same reason, a piece of bread kept in the cake-box will keep the cake fresh longer. A new piece should be put in each day.

Place in Diet. Cakes, little cakes, and pastry

have a place in the diet; but they should not be used to excess nor to the exclusion of the simpler desserts. On account of the great amount of sugar and starch they contain they usually have a high energy-giving value. Certainly the sight of an attractive dessert stimulates an interest, and, coming as it does at the end of the meal, it stimulates the action of the digestive juices and probably hastens the digestion of the other foods.

But as these desserts lack protein and mineral matter, they must always be an accessory to a menu rather than a principal article of food. Children must be guarded from the danger of forming a habit of making cake the chief part of any meal. If they are carefully trained to eat sufficiently of a substantial and mixed diet, there will be no danger to them in the amount of wholesome cake they eat. As for pastry, it is well not to give it to young children at all, and to boys and girls of high-school age only occasionally.

VIII

THE INDISPENSABLE VEGETABLE

GREATER familiarity with the many vegetables growing close at hand and knowledge of their comparative food values would do much to improve the health of the average American family, helping to give that variety of food which should be taken at each meal. An acquaintance with the changing market prices of vegetables will do much to reduce the food bills. The housekeeper who keeps herself informed as to whether the crop of onions was large or small, brussels sprouts plentiful or scarce, will choose the vegetables for her table from those which are cheap and plentiful. The thrifty housekeeper keeps an eye on the market quotations of the daily paper, as the broker does on the fluctuations in stocks. (This subject is again referred to in Chapter XIX.)

With a variety of vegetables growing and easily cultivated in a kitchen garden by country and town dweller, with markets offering all domestic as well as foreign vegetables, the average American housekeeper gives her family potatoes every

day, and in many families every meal, occasionally adding tomatoes, corn, or peas. A visit to a large central market where there is one, and a series of small markets where there is not, with a determination to know all the vegetables offered for sale in the neighborhood, will be surprisingly enlightening.

"You may lead a horse to the water, but you cannot make him drink." Many a housekeeper's efforts to reduce the cost of living by selecting vegetables with reference to their food value has been a failure because the family habits are so set they will eat only the vegetables they know well. Fortunately, however, there are few things a determined, tactful woman cannot accomplish. Many a family has been led to eat a variety of vegetables by serving the few they demanded in different ways until variety became custom. Gradually new vegetables appeared on the table, and the family without being conscious of it were eating and enjoying the very vegetables for which they had formerly expressed great aversion.

It will help the housekeeper to classify the vegetables, making a few general rules for selection, preparation, and cooking. Under the general name vegetable come the plant foods—cereals, legumes (the pod-bearing plants), tubers (roots and bulbs), green vegetables, vegetable fruits, and flowers. In this chapter the term vegetable will be used in a more restricted sense, and only those considered which are served at table as vegetables.

Composition. The green vegetables are four-fifths water by weight, their chief value being the mineral salts they contribute to the diet. It is of great importance to the health of our families that the daily food should give sufficient mineral matter; but where economy is necessary, one must consider, before buying lettuce, spinach, and celery at winter prices, and see whether this contribution to the daily food cannot be procured at a less cost. Dandelion plants have been cultivated outside of Paris for twenty-five years, and are used on the Continent to take the place of our more expensive greens. They are now grown here, and served as a delicacy in some restaurants; but there is no reason why they should not be more generally grown and sold at a reasonable price.

The vegetables which make the greatest return in food value are the legumes (peas, beans, and lentils). They give starch, protein, and mineral matter. Of course, fresh they are more delicious, and canned they are more convenient; but dried peas and beans are the food which give the largest return for the money expended, and by skilful cooking they may be made very palatable. One and one-third pounds of pea flour will supply the protein required daily by an active man. Suppose this were given in the form of pea soup—a good thick soup would contain a heaped spoonful of the flour for each plateful. The protein value of this is equal to an ounce of meat. Pota-

toes, carrots, parsnips, and beets are one-half to three-quarters water. The dry matter is largely starch, with some sugar and a small quantity of protein, mineral matter, and fat.

Selection. Fresh, tender, firm vegetables should be chosen, never those that have softened and started to decay. Often dry and withered vegetables can be freshened by allowing them to stand in cold water. If this is done, care must be taken to remove any decayed parts, as nothing produces decay as quickly as contact with decay.

The heavier vegetable is usually the better one. It is worth while to watch the thrifty German mother buy for her large family. She balances the head of cabbage in her two hands, choosing the heavier; she has her potatoes weighed after she has selected those with a netted and corky skin, because the clear, smooth skins are apt to be watery and immature. The housekeeper who knows buys if possible where weight, not bulk, is the standard of measure.

The time expended in going to the market and selecting the vegetables for the day will be well paid for in the money saved and better food provided. Even the honest tradesman must choose between a good and best article, and, after all, it is his business to sell, the housekeeper's to buy. The housekeeper who goes to the market selects the best vegetables, while what is left goes to fill the telephoned order.

Circumstances so alter cases that it is difficult

to give any rules about buying vegetables in quantity. With a dry, cool store-room it may be an economy to buy potatoes, carrots, onions, and parsnips in the fall. Such a store-room requires constant attention, as decay spreads very rapidly and can quickly destroy more than the money saved by early buying. In the average family in the city it is better economy for the housekeeper to cultivate a judgment to know the best article and keep at her finger-ends a scale of values to guide her buying in smaller quantities.

Canned vegetables are as a rule harmless; that is, where they are put up in clean factories and under sanitary conditions. They are expensive compared with the fresh food, because a large proportion of water is being paid for—that used in the preparation. The loss in cooking is greater, because the food is twice heated in water, once at the canning-factory and again in the home kitchen. For some families this loss is compensated for by the shorter time required in preparation.

Preparation. Vegetables that form in heads, such as cabbage, cauliflower, and brussels sprouts, should be put head down in cold, salted water, to which a few spoonfuls of vinegar may be added. This treatment will drive out any worms or insects from between the leaves. All vegetables should be cleaned before cooking. A small scrubbing-brush kept for this purpose is a great convenience, and marking a capital V on the back of it will insure its use for this purpose only.

When skin is to be removed, care must be exercised not to cut away the edible portion. It is best economy to prepare the vegetables just before cooking. The pods keep the peas and beans moist and fresh, as does the husk the fresh corn. The pared potato, carrot, and tender onion soaked in cold water for an hour or more before cooking will lose both flavor and food material.

Cooking. Most vegetables may be baked, roasted, fried, boiled, or steamed. All vegetables can be prepared in a number of different ways, and by skilful combination give endless variety to the daily food. The simple methods of cooking and serving vegetables are the best, particularly when care and intelligence preserve the characteristic flavor. Spenser tells of the Irish in 1580, that "wherever they found a plot of shamrocks or watercresses they had a feast, and there were gourmets even among them, for some gobbled the green food as it came, and some picked the faultless stalks and looked for the bloom on the leaf."

The changes that take place in vegetables in cooking soften them, make the starch more digestible, and develop flavor. The woody structure of vegetables is softened by heat and moisture in cooking. The tougher the structure, as in old vegetables, the longer this process will take. Starch increases in bulk and becomes gummy and opaque when heated with water.

The raw starch is not acted upon by the digestive juices as is the cooked starch.

Just what contributes to make the flavor of all the vegetables is not thoroughly known. Experience has taught us that over-cooking them destroys the flavor most liked, and in many cases produces a strong, unpleasant taste. It is also true that over-cooking of vegetables is often the reason for digestive disturbances. Cabbage, for instance, is apt to cause flatulence and be difficult of digestion when cooked for hours in a covered pot; yet when cooked quickly uncovered it is delicate in flavor, and by most people easily digested. Properly prepared it is as delicious as cauliflower and costs considerably less. A cabbage costing five cents serves a family twice, where a fifteen-cent cauliflower is all eaten at one meal.

Boiling and Steaming. To secure the best results all vegetables except dried peas and beans must be put into boiling salted water, the water must be made to boil again as soon as possible after the vegetable is put in, and must be kept boiling until the cooking is done. There is always danger of over-cooking vegetables. The time of preparation can easily be arranged so that they can be served as soon as done. What the Irishman said of the potato is true of other vegetables in less degree: "Potatoes must be aten, not waitin'."

Water-soaked vegetables (those cooked in

warm, not boiling water) are also the cause of much digestive disturbance. The age of the vegetable must be considered in arranging the time-table for cooking, the older vegetables requiring a longer time. A little soda added to the water is said to help make the tough old vegetable tender. Care must be used not to add too much soda, as it will injure the flavor. The French add a little sugar to the water, and this gives a fresh, sweet taste well worth the consideration of the American housekeeper. There are several advantages in cooking some vegetables uncovered. Green vegetables retain more of their color, and strong-flavored vegetables like onions and turnips lose much of their offensive flavor.

Fresh, tender vegetables—such as peas, young beans, spinach, summer cabbage—lose much of their nutritive value when cooked in a large quantity of water. The better method of cooking is steaming, because in this way less material is removed than when they are boiled. A steamer can be improvised by using a colander or strainer set in a saucepan over boiling water and tightly covered, that the steam may circulate about the vegetables.

Steaming cooks the vegetables in their own juices without the constant danger of burning, which often occurs in the boiling of spinach in its own juices, or in heating peas slowly in a pan lined with lettuce leaves. The slow heat draws

out the juice from the leaves, providing the liquid in which the peas or spinach are cooked. This method requires constant care to keep the heat just right so that the cooking may continue without the vegetables being scorched or burned. Potatoes and carrots lose nutritious material when they are pared before cooking, particularly when they are pared and cut in pieces. The sugar dissolved out of carrots diced before cooking, in one experiment, was found to be at the rate of a pound to the bushel.

It is also a saving of time to cook vegetables in their jackets, as the skins are much more quickly and easily removed. Sometimes in strong-juiced vegetables, such as winter cabbage and strong onions, there is too much flavor, and several waters are used in the cooking to reduce the flavor. It is true that mineral matter is lost in the water drained off. Where economy is the rule, this water can be used as a foundation for soup.

Baking. In baking vegetables there is little loss of material except the water which is driven off by the heat. Baked potatoes, both white and sweet, are among the most easily digested and wholesome vegetables. These will be light and mealy if the skins are broken five minutes before they are taken from the oven. This allows the steam to escape and the inside of the potato to dry, making it much more delicious. Very small potatoes, thoroughly scrubbed and well baked, are

palatable, especially to people who like to eat the skins. Eating the whole potato has an advantage, as the mineral matter which lies close to the skin is lost when the skin is discarded. The coarse cellulose of which the skin is composed is a good intestinal sweeper. Squash is excellent baked, as are tomatoes, egg-plant, and onions.

Frying. Many people, especially hearty out-of-door workers, like fried vegetables. Those containing a large quantity of starch are usually parboiled before frying, to soften the cellulose and start the change in the starch. But such vegetables as tomatoes, squash, and egg-plant can be sufficiently cooked in the hot fat. It is as true of vegetables as it is of other foods cooked in fat that they are indigestible if fat-soaked. To prevent this the fat must be hot when the food is put in and drained off before serving.

Cold vegetables can often be reheated by sautéing or pan-frying, changing the flavor and appearance so entirely that the family will not realize they are eating left-overs. Many housekeepers are like the queen sung of in the nursery rhymes: "What they did not eat that day the queen next morning fried."

Stew. A ragout or stew of vegetables will help to make an acceptable dinner when a small quantity of meat must suffice. Sliced cucumbers and onions, browned well, then stewed in water for half an hour, and served with a well-seasoned

gravy made with the water left in the saucepan, make only one of many combinations.

Sauces. To put on our table delicious vegetables great attention must be paid to the flavoring and to the sauces served with them. The well-known drawn-butter or white sauce so commonly served on creamed potatoes, carrots, onions, celery, and other vegetables can be a delicious addition or a forbidding concoction reminding one of paper-hanger's paste. When the sauce is cooked the starch in the flour swells and becomes sticky, and must be prevented from massing together. This is done by blending the flour and the butter, or flour and cold liquor, before adding the milk or vegetable stock, and by stirring constantly during the cooking. The cooking must continue long enough to leave no raw-starch flavor.

The proportions for a thin white sauce are one tablespoonful of flour to one cup of liquid. For a medium white sauce, two tablespoonfuls of flour to one cup of liquid. For a thick white sauce, three to four tablespoonfuls of flour to one cup of liquid. The butter may be the same quantity as the flour or one-quarter as much.

The wise housekeeper masters the art of making simple sauces and varies the kind and flavor to suit the vegetables and harmonize with the rest of the meal. When vegetables are cooked in boiling water this water should be used to make a sauce, as this saves the flavor from the

vegetables dissolved in the water. Or the vegetable stock may be used as a foundation for soup. Much flavor and nutritive material is thus saved.

The combining of other foods with the vegetables to give them greater nutritive value will help reduce the meat bill. Cheese added to scalloped cabbage or potatoes makes a really nutritious dish.

As a matter of fact, it has been found that while the pulses peas, and beans, are most valuable sources of protein, they are not adapted to the exclusive diet of health. Few people can eat them every day. It is, however, a pity that they are not used at least once or twice a week by those to whom economy is important.

French or kidney beans, either fresh or dry, contain a larger quantity of cellulose, and are therefore not as economical as are lentils. Egyptian lentils are richer in protein than either peas or beans, and because they contain less sulphur are less apt to cause flatulence. If the tough skin of the dried peas or beans causes digestive disturbance they may be soaked, cooked slowly until soft, and pressed through a colander, making a purée. This may be added to milk to make a nutritious cream soup or be served as a purée.

The French housekeeper makes a delicious pea or bean purée to serve in the place of the more expensive meat. Five cents' worth of dried beans give a food value equal to eight cents' worth of sirloin beef. The beans give starch in

place of the fat contributed by the beef. A purée can be made representing a somewhat larger food value than does the sirloin beef, and for half the cost. A leg of mutton costs about one-fourth more than a purée of beans for the same food value. No family will consent to eat bean purée every day, any more than they will eat mutton every day; but the saving for the month when a purée is served once a week in place of the more expensive meat will approach fifty per cent., and a business man would consider his fortune made could he with any frequency secure the same result for fifty per cent. less money.

Experience has so thoroughly taught the need of a sufficient amount of starch food that it seems unnecessary to emphasize its importance to the daily fare. Habit has made potatoes almost a necessity to many families; sweet potatoes give a little less protein than do white potatoes, more starch and sugar, and a greater fuel value. The money cost is about equal when weight is the standard of measure. Beets are a little more expensive than potatoes, and contribute half as much food value. Onions give about the same food value as potatoes for the same money, but the bulk is greater; it takes three onions to equal the food value of one medium potato.

How many housekeepers realize that they are buying the starch for their families in an expensive form when they buy potatoes at eighty or even

sixty cents a bushel? Macaroni, rice, corn-meal, carrots, offer practically the same material at less cost. It usually requires greater skill to prepare the less costly food. Extra intelligence, care, and skill, on the one hand, or money, on the other, must be expended for the same return.

A well-made cream-of-carrot soup is delicious. The carrots should be cooked a long time in milk in a double boiler, then strained and seasoned with intelligence. The reward is as great as the cost is small.

Onion bouillon is made of four large onions put in one-half pint of cold water, boiled for ten minutes, and drained. One tablespoonful of butter is then heated in a saucepan, the onions added and cooked slowly in the butter three to five minutes. One tablespoonful of flour is next sprinkled over, they are stirred well and cooked brown. One and a half quarts of hot water, one-half teaspoonful of salt, pepper, and one ounce of beef-extract or soup-stock are next added, the whole cooked slowly, covered, for twenty minutes, and strained into cups in which are rounds of toast covered with grated Swiss cheese. This will please many people who never eat onions in any other way. Fresh pea-pods contain much flavor, and can be boiled for an hour, rubbed through a sieve, and used to flavor soup.

Salads. Vegetables with their wealth of color admit of various and interesting effects. If, as many preach, color has an influence upon the dis-

position and health, why not produce pleasing color combinations with the vegetables served together and give the family the benefit of this influence? The coolness and crispness of a salad not only furnish a valuable source of mineral matter, but often tempts the appetite and stimulates the digestive juices to such an extent that the rest of the meal is more easily digested.

A salad is sometimes considered a luxury, but skill in combining left-overs disproves this. When tomatoes are in season many depend largely upon them for attractive salads, combining them with nearly everything in and out of the garden. For example, a slice of tomato sprinkled with finely chopped chives or onions and arranged on a crisp lettuce leaf makes an appetizing dish. A whole tomato with the center scooped out and stuffed with chopped nuts and figs is the extreme of the combinations. When tomatoes are less plentiful they are still sought after to garnish a salad. They are also served in the form of tomato jelly, easily made from the canned vegetable.

A very substantial and nutritious salad is made of peas, either fresh or canned, and chopped nuts. Lima beans are as delicious in a salad as served in any other way. An economical and nutritious salad is made of several vegetables—peas, beans, beets, cucumbers, tomatoes, onions, chives, or any vegetable which the garden or larder furnishes.

When the salad is arranged on various salad greens and dressed with finely chopped egg-yolk, egg-white, and chives it is called a chiffonade salad. This is best served with a French dressing. A potato salad is a hearty and appetizing dish. This is usually served with a cooked dressing and sometimes with a mayonnaise. In this the dry ingredients and the acid, either lemon-juice or vinegar, are put in the bottom of a bowl. When a French dressing is used it is well to add some fat to the salad in the form of bits of well-cooked bacon. A potato salad is often made more interesting by the addition of bits of cucumber or tomato. No vegetable salad is complete without a suggestion of onion or chives, and many people consider a salad most uninteresting unless the salad-bowl or the bowl in which the dressing is mixed is rubbed with a garlic clove.

To arrange an attractive salad is not only a culinary but an artistic triumph. The greens should be crisp, clean, and fresh, the vegetables cut with precision, and combined with color as well as flavor in mind, and the dressing should be generous in amount, but not so plentiful that the dish looks unappetizing.

To sum up, the housekeeper who is serious in the determination to reduce her food bills, yet preserve the health and efficiency of her family, will study the United States Government food bulletins. She will know when she is paying for

large quantities of water and tiny quantities of mineral matter. She will become intelligent as to the quantity of starch a vegetable contains and its comparative cost. Exact knowledge of her family's need and the great importance of the mineral matter to the body's health will influence her in providing an abundance of vegetables for her table. She will remember that the mineral matter in vegetables and fruits acts as a tonic to the body, stimulating the intestines to activity, is necessary to the complicated machinery of digestion, and essential to the healthiest life of the body. Older people often suffer from a lack of mineral matter in their food, but children suffer even more. The wise mother will take care to give the growing children sufficient mineral matter as well as the other foods they need, to make healthy bodies, and happy, well children.

VEGETABLE	SELECTION—CARE AFTER BUYING	PREPARATION FOR COOKING	METHODS OF COOKING	TIME	SERVING	REMARKS
Asparagus	Stalks green—the ends should show they have been recently cut. Keep standing in cold water.	Snap stalks off as far down as they are brittle; wash.	Cook in boiling water, salted.	30 to 45 minutes.	Drain. Serve on toast seasoned, or with the white sauce. As salad.	Keep water used in cooking as addition to soups.
Beans: Fresh, Lima	Choose those with fresh, juicy pods.	Wash; shell.	Cook uncovered in boiling water. Add salt when nearly done.	1 to 1½ hours.	Drain. Serve in some of the water used in cooking.	When possible cook beans in soft water.
String				6 to 8 hours.	Puree. Salad.	
Dry	Choose small, even ones.	Wash well; soak overnight in cold water.	Drain; cover with cold water; boil, drain, add boiling salted water.	Until tender.	Drained, seasoned.	If the beans are old and hard, add soda to the water they are cooked in.
			Baked after boiling.	8 to 10 hours.	Serve in bean-pot. Puree.	

Beets	Choose those having dirty roots and fresh leaves.	Wash, being careful not to break the skin. Cut tops off 2 inches above the roots.	Cook in boiling water, add salt when nearly done.	1 to 4 hours.	Drain, remove skins, season, serve. Pickle. Salad.	Beets can be stored in a dry, cool place for winter use.
Cabbage Cauliflower	Choose firm, heavy heads. Keep in a cool, dark place.	Invert in salted water for ½ hour.	Cook in boiling salted water. Scallop the boiled cabbage or cauliflower.	25 to 60 minutes.	Serve in white sauce. Salad.	Grated cheese over scalloped or creamed cabbage makes a nutritious dish.
Carrots: Summer Winter	Choose those with fresh green leaves. Small ones.	Wash, scrape, drop into cold water.	Cook in boiling water.	35 to 45 minutes.	Serve diced in white sauce.	Use water carrots are cooked in as addition to soup-pot.
Celery	Choose stalks that are white, crisp, and fresh.	Wash, cut into pieces 2 to 4 inches long.	Simmer in water.	1 hour.	Serve in medium white sauce.	The root, well cleaned, should be cooked too.

VEGETABLE	SELECTION—CARE AFTER BUYING	PREPARATION FOR COOKING	METHODS OF COOKING	TIME	SERVING	REMARKS
Corn	Silk should be brown, ear filled with well-developed kernels. Sweet, juicy milk should flow from kernel when pricked.	Remove husks and silk.	Drop in good-sized kettle of boiling water.	10 to 25 minutes.	Serve on the cob, or scrape the kernels from the cob and season.	Cooking in salted water hardens and wrinkles corn.
Egg-plant	Select a firm, heavy one.		Baked.—Remove from shell, season, and bake in shell.	15 minutes.	Serve in the shell.	
		Cut in ¼-inch slices, salt, pile one on the other, set plate holding weight on top, let stand an hour.	Fried.—Dip in egg, and fry to saute.	Until brown.	Serve hot.	
			Broiled. — Season boiled slices and broil.	Until brown.	Serve immediately.	
Kohl-Rabi	Best if young and tender; a diameter of not more than 2 or 3 inches.	Wash, pare, and cut in thin slices.	Cook in salted boiling water, uncovered.	30 to 50 minutes.	Drain, season. Cold, used for salad.	

Onions	Select uniform-sized, firm ones that have not sprouted.	Cut off roots, wash, and peel.	Stewed. — Boil in salted water, uncovered.	30 to 60 minutes.	Serve in white sauce, or seasoned and buttered.	
			Baked.—Boil 5 minutes, scoop out the centers, mix with bread-crumbs, stuff in the center of onion, bake.	½ hour		
			Fried.—Cut in slices and brown in butter.	Until brown.	Serve as a garnish to meat.	
Peppers	Select firm, even sizes.	Wash, cut off tops, remove seeds.	Baked.—Boil 5 minutes; when cool fill with rice, meat, or bread-crumbs.	½ hour	Served with tomato or white sauce.	Dry the top of the pepper and keep it to use as seasoning.
Parsnips	Choose young, firm ones.	Wash.	Cook in boiling water; scrape off skin.	35 to 50 minutes.		Best in early spring.
			Cut in half, brown in butter.	Until brown.		

VEGETABLE	SELECTION—CARE AFTER BUYING	PREPARATION FOR COOKING	METHODS OF COOKING	TIME	SERVING	REMARKS
Peas	Take only those with green little pods. Peas are injured by keeping.	Wash pods before shelling.	Cook in boiling water; add salt just before they are done.	20 to 40 minutes.	Serve without draining, or drain and add butter, or serve in white sauce.	If the peas are old, add ½ to 1 tablespoon of sugar to each ½ peck of peas while cooking.
Potatoes: White and Sweet	Pick out firm, sound ones; usually those with a corky skin are better than those with a smooth skin.	Wash thoroughly, pare, drop in cold water.	Bake in skins. Cook in salted boiling water. Fried. — Boil them, then fry or saute. Scalloped.	30 to 50 minutes. 20 to 30 minutes.	Serve in a napkin. When new, season and serve. Older potatoes, drain, mash, or cut in cubes, season, serve in white sauce.	Break open when they come from oven, to allow steam to escape.

Squash: Summer	Select squashes so young and tender that the thumb-nail can easily pierce the rind.	Wash, cut in pieces, or in halves; butter.	Steam. Bake.	1 hour. 20 minutes.	Mash and season.	Squash is improved by the addition of butter.
Winter	Select sound ones.	Break into pieces and take out seeds.	Boil or steam until tender. Bake.			
Spinach	Choose it with leaves fresh and sandy.	Cut off roots and the poor leaves. Wash thoroughly in many waters.	Cook in its own juices, uncovered, or steam.	15 to 30 minutes.	Chop and serve with butter and seasoning or white sauce. Cold, as salad.	Old spinach may be cooked in water.

IX

THE EQUALLY INDISPENSABLE FRUIT

WHEN every house was set in a garden a cherry-tree, an apple-tree, and a grape-vine were the possession of even the humblest family, and the ripe fruit was the common property of the members of the family. Even the small children ate fruit whenever they wanted it, the only restriction being that it must be ripe. Those who have sat in a crotch of a cherry-tree and eaten all they could of the juicy, ripe fruit, or those who have sat under a peach-tree in August eating the luscious peaches just picked from the tree, remember suffering no ill effects, except when they ate over-ripe or green fruit.

It is true that even invalids and young children can eat many kinds of perfectly ripe fresh fruits with good results. Grapes picked with the dew on them and eaten under the grape-vine have formed the principal part of many famous health cures. Wonderful tales have come to us from our great-grandfathers' times of almost miraculous cures resulting from eating fresh fruit. Our present knowledge of physiological chemistry

shows us there is more than a grain of truth in these tales.

Composition. We know why families who eat quantities of fruit keep well, have good complexions, and are not fighting the increasing malady of constipation. Fruit contains very little protein or fat, but large quantities of water, varying amounts of sugar, and, most important of all, mineral matter and acids. These substances are held in a framework of cellulose.

Not only is the water in fruit made palatable by the characteristic flavor of the specific fruit, but there is no danger from contamination of disease germs when it is taken from the fruit itself. The outside skin of the fruit may harbor disease germs, but they are not possible in the sound fresh fruit.

Fruit-sugar is easily digested, and almost never causes sour stomach or other digestive troubles, such as are caused by too much cane-sugar. As has been said, the mineral matter and acids are the valuable contribution of the fruits. They act as regulators, body-cleansers, and blood-purifiers, helping the body utilize other kinds of food. Often people who are made bilious by milk and eggs can eat them when fruit is also part of the diet.

In the old days when it took three months to cross the ocean in a sailing-vessel, scurvy was a more common disease than now. The careful sea-captain always carried a goodly supply of

lemons. Fruit and fresh vegetables corrected the trouble, and lemons were easily carried and particularly efficacious.

In this day of easy transportation, foods from all parts of the world may be had at any time and place, and a mixed diet is so easily procured that the diseases like scurvy (resulting from eating only one kind of food) are not frequent, though we still meet a tendency to scurvy where people, either from choice or necessity, do not eat enough fresh vegetables and fruit. However, the adult who eats only one kind of food for a considerable time will feel the consequences, and, if wise, will correct his unbalanced diet by eating a variety of foods.

As in all questions of feeding, it is the food given the children which is of the greatest importance. Serious results follow in the unhealthy development of their bodies when their food lacks mineral matter and the acids found in fruits. One authority upon food, Van Noorden, who advocates the use of meat for adults only, says: "As far as the children are concerned, we believe we could do better by following the dietary of the most rigid vegetarians than by feeding the children as though they were carnivora, according to the bad custom which is still quite prevalent. If we limit the most important sources of iron—the vegetables and the fruits—we cause a sluggishness of blood formation and an entire lack of reserve iron, such as is normally found in the

liver, spleen, and bone marrow of healthy, well-nourished individuals."

According to the instruction of modern science, babies, particularly bottle-fed babies, are given orange-juice. From the time a baby reaches its third month it is usually given orange-juice each morning. Not more than a teaspoonful should be given to a three-months-old baby, and then it must be carefully strained through a coarse cheese-cloth and given a half-hour before the first feeding. If given just before a feeding it may cause sour stomach. The effect of the juice is better when taken on an empty stomach. The amount of orange-juice should be gradually increased with the age of the baby. The juice of half an orange may be given at a year old. The baby's digestive organs are not formed and are very sensitive, with little or no resistance or endurance. They cannot regulate any disturbing food, as can the fully formed digestive organs of the older person. Therefore the orange for the baby should be sweet, neither under nor over ripe.

Fruit is, then, a necessary part of the daily food if we are to have healthy bodies. As the well-known saying puts it, "An apple a day keeps the doctor away." Then we ask which fruit the wise housekeeper buys for her family; and, since the apple and cherry trees are things of the past in cities, and fruit bought in the market cannot possibly be perfectly fresh, we ask how the fruits that we can have compare in food value and cost.

Some fruits that are easily digestible when eaten perfectly ripe and fresh will cause digestive disturbance because of having been picked green and artificially ripened, or from changes which occur from exposure to the air after picking. These marketed fruits may be made perfectly wholesome by cooking if they have not started to decay. Many fruits are successfully preserved by drying. Some of them are edible in the dried condition, such as figs, dates, and raisins. Others, like dried apples, apricots, prunes, are better when the water has been restored by long soaking and slow cooking.

Fruits may be classified botanically or medicinally, but a popular classification is more convenient, as: (1) apple, pear, quince; (2) stone fruits—plum, peach, apricot, cherry, olive, and date; (3) strongly acid fruits—orange, lemon, lime, grapefruit, grape, gooseberry, currant, cranberry, barberry; (4) fleshy fruits—strawberry, raspberry, blackberry, mulberry; (5) pineapple, fig, banana; (6) nuts.

(1) Apple, pear, quince. These market better than many fruits. Pears do not keep as well as the other two. They all contain the substance called pectine, which makes fruit juices "jell." The cellulose framework of these fruits is rather tough, and apt to cause intestinal irritation. Cooking softens the cellulose, rendering the fruit more easily digested. Baked apples may be given invalids or young children. Uncooked pears and

quinces should be eaten only by the vigorous adult.

(2) Stone fruits: plum, peach, apricot, cherry, olive, date. These are fruits which must be eaten fresh and ripe or preserved in some way. All of these are successfully dried and used as food. The dried plum or prune is one of the less expensive fruits. When properly cooked, according to the general direction given later, they are an agreeable addition to the table.

(3) Strongly acid fruits: orange, lemon, gooseberry, grapefruit, grape, blackberry. These have less nutritive value than many other fruits, but valuable medicinal qualities. Eaten an hour or two before a meal, they so stimulate the intestinal activity as to be valuable body-cleansers—stubborn cases of constipation of long standing can be cured by faithful eating of these fruits at least an hour before a meal, preferably at night or in the morning.

A glass of orange-juice taken the first thing in the morning is an effective cathartic. This is due to the fact that no other food is present in the stomach at this time to prevent the fruit-juice from coming in contact with the mucous membrane of the stomach and intestinal canal and stimulating it to action. Fruit eaten with other foods will have no special laxative effect. Many people find that the acid fruits eaten with or just before starchy foods, such as cereals, will interfere with the digestion of the starch, but they are

always safe eaten alone. Others find that fruit as the first course to a breakfast stimulates a lagging appetite and incites them to eat a meal which at first seemed impossible. The best time, then, for eating fruits must be decided by the individual.

(4) Fleshy fruits: strawberry, raspberry, blackberry, mulberry. When Macaulay returned from India he declared he would give all the fruits of the East for "a pottle of Covent Garden strawberries," and most people agree with him in considering these berries one of the most delectable. They are richer in potash and lime salts than most fruits. For delicate digestions and for young children the small, sharp seeds are apt to cause intestinal irritation. These can be strained out of the crushed fruit and the fresh juice taken raw or cooked. Physiological chemists have not yet decided why strawberries, even the juice, have a bad effect on some people, but those who feel this result should of course avoid this fruit. There is no reason to suppose that its acid is harmful to those who feel no bad effect. The other fleshy fruits can be eaten by any one in normal health.

(5) Pineapple, fig, banana. Pineapple is particularly soothing to a sore or irritated throat. It is difficult to digest only when unripe. Figs as we know them are the dried fruit. Weight for weight, dried figs are more nourishing than bread, and a pint of milk and six ounces of dried figs make a good meal.

Bananas are another fruit offering considerable food value. As we get them they are more easily digested when cooked than when raw. It is not advisable for young children to eat the uncooked banana.

To sum up the food value of the fruits, they contain little protein, very little fat, and considerable sugar, a good deal of water, and valuable acids and mineral matter.

Selection and Care. Perfectly sound ripe fruit should be chosen. When the skin is broken, decomposition has probably started, which makes unhealthy foods. The heavier fruit is the better one. Fruit that comes from the market should be thoroughly and carefully washed, and it is wiser to pare off the skin from marketed apples, peaches, and plums rather than to bite through, as is safe to do with fruit just off the tree.

Berries are better washed in a colander that stands under the cold-water faucet. The stream should play over them gently long enough to wash them thoroughly, or they may be put into a larger quantity of water and stirred about with the hands. Hulls should be left on until after the washing, as they prevent the juices from escaping.

Cooking. Since fresh fruit contains much water, little more need be added in cooking. It should be cooked in a covered earthenware or agate vessel. Heating slowly draws out the juices. The time of cooking depends upon the ripeness of the fruit. Unripe fruit must be cooked long

enough to soften all hard parts. Over-ripe fruit need only be heated to the boiling-point. When sugar is needed it should be added after the fruit is taken off the stove. If the sugar is added before cooking, more must be used for the same degree of sweetness. Long cooking or cooking uncovered destroys the characteristic flavor of the fruit without producing any desirable result.

Almost all fruits can be cooked in the oven. There is not the same danger of burning as when the cooking is done directly over the heat. A baked apple looks better if the skin is cut in an even line around the apple before it is put in the oven. Apple-sauce made in the oven and cooked just long enough to soften the apple is much more delicious than that cooked for an hour or more.

Fruits, especially apples, are cooked with advantage in the chafing-dish, and if kept well covered the apples remain white; all fruits retain their rich color and flavor when cooked in this way. Pears and quinces baked or stewed are much more easily digested than are the fresh ripe ones.

Nature gives us so choice a food in the fresh ripe plum, peach, apricot, and cherry that we cook them only when they are over or under ripe, or as a means of preservation. They are so juicy that no water need be added. They should be heated slowly and simmered until soft. Sugar must be added cautiously, not to destroy the fruit flavor. Of the strongly acid fruits, those most commonly cooked are gooseberry, currant,

cranberry, barberry. These make delicious sauces. They must be cooked until soft, and sugar added as soon as they are taken off the fire. They are better cooled before serving.

Bananas can be cooked in a variety of ways. Rolled in olive-oil and powdered sugar, then fried, is an excellent method. They are more easily digested when laid in a baking-dish, sprinkled with lemon-juice, and baked.

Preserving and Canning. The frugal housekeeper selects for canning firm, fresh, well-flavored fruit, just before it is perfectly ripe.

There are two methods by which the skins of such fruits as peaches, plums, pears, and apples can be easily removed. One is to plunge the fruit into hot water. This loosens the skin so that it peels off very easily. The other way is to rub the fruit with the blunt edge of a silver knife, which releases the skin. The second method has the advantage of not softening the fruit as the hot water sometimes does, but it requires skill and practice for equal success.

Fruit may be canned whole or in pieces, with or without the skin, seeds, stones, or even stems. The essential point is to kill the bacteria by heat and to prevent any bacteria getting to the fruit. The causes of decay in food are the tiny plants which float about in the air. When they lodge in any plant or food they increase in numbers, destroying the food. The tiny plants which spoil our fruit are wild yeast plants and bacteria. Fruit

will not decay or spoil if it is kept free from destroying bacteria and yeast plants.

Everything that comes in contact with the fruit must be cleaned by boiling. Any yeast or bacteria which may be on the polished glass or agate surface of the jars, spoons, or pans are more easily and quickly killed than are those that may be in the fruit.

The most common method of canning fruit is to heat it to the boiling-point and pack it in jars which have stood in boiling water for at least forty minutes. These jars must be sealed thoroughly so that air cannot penetrate. If this is done the fruit will keep for years.

Most recipes call for some sugar. An excess of sugar destroys the flavor of the fruits, adds to the cost of the product, and makes a food too rich to be easily digested. The old-fashioned preserved fruit is made of equal parts—one pound of fruit and one pound of sugar. The modern proportion differs for each fruit.

For either the canned or preserved fruit a syrup is made of the sugar and fruit juice or water. The whole pared fruit is cooked in this syrup until tender. This may be done in the preserving-kettle, and the cooked fruit packed in the sterilized jars, or the syrup may be poured over the fruit after it has been packed into the jars.

For an average-sized family the pint jars will prove the best. They have the advantage of holding enough for one occasion, and not too

much. In this way the family escapes the monotony of cherries for three consecutive days, followed by pineapple in rapid succession. If the jar is opened the contents will not keep in good condition when exposed to the air. There are even smaller sizes than pints, which are desirable for smaller families.

A dry, dark, cool store-closet is the best place to keep the canned and preserved fruits and jellies. When the store-closet is not dark, the jars can be wrapped in paper as a protection from the light.

Commercial canned fruits should be perfectly wholesome and as good as those prepared at home. When laws are made and enforced that regulate the preparation of food in an absolutely clean manner, the city dweller can buy her preserved fruits with safety. It will always pay the country housekeeper to can the fruit grown on the place.

When much preserving, canning, and jelly-making is to be done, a considerable saving is accomplished when sugar is bought by the barrel at its lowest price. An inspection of the fluctuation in food prices published in the daily paper will tell the woman who knows when she can buy most profitably. Sugar is a staple which it pays to buy in larger quantities than some other foods.

Jellies. In the excellent bulletin on "Principles of Jelly Making," by N. E. Goldthwaite, University of Illinois, the author says:

"The process of jelly-making appears simple enough, merely a matter of cooking fruit-juices and sugar together until the whole mass 'jells' on cooling. It is a substance called pectine in the fruit-juice which makes it jell. If there is pectine in a fruit-juice, jelly can be made from it; if there is no pectine, jelly cannot be made. The following simple experiments will disclose the presence or absence of pectine in a fruit-juice:

"To two teaspoonfuls of the cooled fruit-juice add two tablespoonfuls of alcohol and mix thoroughly. If pectine is present a gelatinous mass will appear in the liquid.

"The housekeeper using this test will discover that different juices contain varying amounts of pectine. The ripeness of the fruit will also affect the pectine. Again, none will be found in the raw juice, and some will be found in the cooked juice. Sometimes a little acid, lemon-juice, or tartaric acid added to a fruit-juice showing no pectine will develop it."

Jelly. Fruits for making jelly can be divided into two kinds. First, juicy fruits. These after being washed are put in a saucepan and heated slowly, stirring with a wooden spoon to prevent burning, until the mass is cooked through. The process may be hastened when doing a large quantity by crushing the fruit with a wooden potato-masher. The cooked fruit is poured into a jelly-bag to drip. Second, less juicy fruits, such as apple, quince, and the like, after being washed

are cut in pieces, skins and seeds included, put in a kettle and covered with water. The rest of the process is the same as with juicy fruits.

The jelly-bag may be made of flannel or of two thicknesses of cheese-cloth. It must not only look clean, but be freshly boiled up in clear water to insure its absolute purity. The devices on the market for holding the jelly-bag are excellent and convenient.

The proportion of sugar and fruit-juice for jelly varies with the pectine in the juice. Currants and partially ripened grapes yield a juice so well adapted to jelly-making that they will usually demand equal measure of sugar and juice, while three-fourths cup of sugar to one cup of blackberry, red-raspberry, and crab-apple juice is the usual proportion. Too large a quantity of sugar tends to make a jelly tough, gummy, or stringy.

When the discouraged cook finds her jelly still liquid she should try boiling it with more fruit-juice. The fault may have been too large a proportion of sugar. Care must be taken that the fruit-juice and sugar do not cook too long together. The glasses should be ready before the jelly is put on to cook. The moment the mixture shows signs of "jelling" it must be poured out. Heating the sugar before adding the fruit-juice simply hastens the process.

Conserves. The delicious conserves so costly to buy are not difficult to make. The fruit-pulp

and sugar are cooked to the consistency of marmalade. When nuts are used they are added just before serving, as they lose their crispness by long cooking and keeping.

Cost. The cost of making jelly and preserving fruit differs very much for different families, as well as in different parts of the country. Where the fruit is grown on the place and would not be used in any other way, only the sugar and the fuel mean an actual expenditure of money. Where city prices must be paid for the fruit, the making of jelly is a doubtful economy. Probably the family table could have fresh fruits all the year round for a less cost.

Many of the jellies sold by the grocer for ten and fifteen cents a glass contain very little of the good fruit. It is often made of parings and scrapings left from the higher-priced fruit. Or the bulk is of apple when its name indicates some more costly fruit. The flavoring is strengthened by artificial flavoring made by the chemist, and the coloring is also artificial.

Nuts. Nuts differ from fruits in that they have a high nutritive value. No other vegetable substance is so rich in fat. Unfortunately, they are slow of digestion, partly because of the dense, compact, cellulose framework. Very thorough mastication will make them much more easily cared for by the stomach.

Cooking softens cellulose, but, unfortunately, cooking develops a disagreeable, rancid taste in

many varieties of nuts. Chestnuts are a variety that is improved by cooking. Boiled until soft, then mashed and seasoned, they add both to the pleasure and nutritive value of a meal. The large Italian chestnuts are the ones usually used to prepare in this way, although our small native chestnut is equally good. The objection to the smaller nut is the rather tedious task of removing the outer shell and inner skin.

Remembering the high nutritive value of nuts, many housekeepers add chopped nuts to a great variety of dishes. Nut bread and nut cake are well known and liked. Nuts added to gelatine dishes make a satisfying dessert. Chopped almonds on rice or mashed potatoes give a variety to these every-day dishes.

Walnuts are also valuable food. Thirty large walnuts would contain as much fat as two and three-fourth pounds of moderately fat beef, but two and three-fifth ounces of the beef would be equal to them in protein. Of almonds it has been said, "No man need starve on a journey who can fill his waistcoat pockets with almonds."

Various nut preparations are on the market, called nut butter or nut paste, in which the nuts are so finely ground that any healthy digestion should be able to take care of them. Of course, the wise mother will not feed nuts in any form to the baby or young children, but for the school-

children sandwiches made of nut-paste are nutritious and economical.

Dried Fruit. Dried fruit has a place in the diet which should not be disregarded. This fruit has the advantage of being prepared for market where it has ripened, thus insuring it from deterioration in shipping. The water which is evaporated from the fruit must in many cases be supplied before cooking. When this is done properly the fruit is very appetizing. Dried prunes, apricots, and apples are at their best when put to soak for eight or ten hours. Of course, they should be washed before soaking, so that they may be cooked in the same water in which they have soaked, thus retaining all flavor and mineral matter. Long, slow cooking is the only process to soften these fruits and make them palatable. A little lemon-juice much improves the flavor.

Raisins, dates, and figs are oftener eaten uncooked than cooked; but they, too, are delicious when stewed or steamed. Steamed figs served with whipped cream make a pleasing variation in the list of desserts. A date paste is an excellent filling for sandwiches. This latter often satisfies a longing for sweets and supplies a certain amount of protein and mineral matter which candy does not. It is difficult to make a cost comparison between fresh and dried fruit, as the market price of fresh fruit and the grades of dried vary, but an experiment in the early spring of 1913 showed

that a dried-apple pie, giving a food value of 1530 calories, cost eight cents, while a fresh-apple pie, giving a food value of only 1680 calories, cost fourteen cents. This comparison, of course, will vary in different localities and with a good or poor apple year.

X

MILK, CHEESE, EGGS

EGGS, milk, and cheese are dairy products, so called because in the early English days the servant who cared for the milk and the chickens was called "dey," and the dey-ry was the department under her care.

Milk is the food produced by nature for young animals. Cow's milk is the most commonly used in this country for general food, but the milk of the goat, mare, and other animals is used to a limited extent in some countries. The general term "milk" will here mean cow's milk, unless otherwise specified.

Milk is a staple food in most countries, and occupied a prominent place in early historic times. It is the food which has received most attention from sanitary authorities in municipalities, and from those trying to better social conditions, because on its quality and purity depends the health—often the life or death—of young children. It is frequently said that it is a perfect food, because it contains all the nutritive constituents required by the body — protein, fat,

sugar-starch (as milk-sugar), mineral matter, and water.

For the baby the one perfect food is the mother's milk, when the mother can supply the normal amount and quality. Where this is not possible cow's milk is the nearest approach to the right food. For the child beyond the nursing period (eight months), cow's milk is the staple food. The modification of cow's milk for the child is referred to later.

The food elements of milk are in proportion to make a perfect food for the child and the invalid. In the active adult it is uncomfortable to take so large a quantity of liquid as would be necessary to supply the needed energy. The digestive tract of the older person requires bulk to keep it in the healthiest condition. A strictly milk diet causes constipation and biliousness, because there is very little unabsorbed material left from milk. This is why even the young child has orange-juice, as explained in Chapter IX. However, milk is a valuable addition to any diet. In the combination of milk and cereals or milk and bread the body uses more of both foods than when they are eaten alone.

Composition. Milk contains eighty-seven per cent. water, thirteen per cent. dry matter. The dry matter is fat (which varies with the breed and food of the cow), protein, casein (or the curd of milk), albumen (the skin that comes on heated milk), milk-sugar, and mineral matter.

Milk is particularly rich in mineral matter, so much needed by the young body. To quote Dr. Henry C. Sherman, "A quart of milk contains rather more calcium than a quart of clear, saturated lime-water, and by far the most practical means of insuring an abundance of calcium in the dietary is to use milk freely as a food."

The milk from the different breeds of cows varies, that of the Jersey and Alderney giving milk yielding a large quantity of rich cream. The Holstein cow gives a milk which is more easily digested and is the best to use where milk is an important part of the diet. Many physicians are now recommending for the invalid and baby a blended milk from several cows of different breeds.

Selection and Care. Milk should be bought only from such dairies as are protected by the most stringent sanitary regulations. That from tuberculous cows will carry the white plague to those drinking it uncooked. Scarlet fever, typhoid fever, and diphtheria are often spread by milk. The disease germs get into the milk from persons handling the milk or from contaminated water used in washing the milk-cans. It is of great importance that no person who has been exposed to a contagious disease be allowed to milk the cows or have anything to do with the handling of the milk. Many fevers, digestive disturbances, and other diseases are caused by dust, dirt, and particles of manure which fall into an unprotected

pail during milking. Some of this is strained out, but the manure will dissolve in the milk, making it a dangerous drink. Bacteria also fall into the milk during milking. These grow and multiply very fast unless the milk is quickly cooled and kept at a low temperature.

A well-known writer says, "Herod was a novice in the slaughter of helpless infants compared with those who provide the poison which is sold as milk, although it would cost far less to have a pure milk than to bury our babies." Every one can help toward a pure milk-supply by using influence to secure laws regulating the health and care of the cow and the protection of the milk from filth and dirt as well as from disease germs. If all the housekeepers would make themselves intelligent about from where and how the milk comes to them, the milk-dealers would be encouraged to deliver clean, pure milk. The dairyman defends himself by saying that the average housekeeper's only concern is to have it delivered in a good-looking wagon.

It is never safe in a city to buy so-called "loose" milk—that dipped from a large can as the customer requires it. Bottled milk from an accredited firm is the only milk worth buying. The "loose" milk is frequently adulterated, and it is impossible for any Board of Health to inspect every can. Recently samples of such milk bought in four small shops in Greater New York averaged only one per cent. fat. The legal minimum of fat in

the city is three per cent. This milk at five cents a quart would cost fifteen cents for the amount of fat in the bottle of milk at ten cents. The added bulk was probably all water, inhabited by many millions of bacteria.

Milk is often contaminated after it enters the house by being left uncovered in a room that is being swept or dusted or where ashes are being emptied. Frequently flies—those industrious carriers of disease!—dip into it. Sometimes there are ridges and cracks in the milk-pitcher, where old food lodges or particles of sour milk catch, to soak off into the fresh milk. All milk-containers should be rinsed out in cold water the moment they are emptied of milk, then washed in warm, soapy water, rinsed with boiling water, and wiped with a fresh, perfectly clean dish-towel. This care is most important for the baby's bottle, which should be allowed to remain in the boiling water for fifteen or twenty minutes.

Milk should be kept in a cool place in covered earthenware, china, or glass receptacles. The top of the milk-bottle should always be carefully washed before the bottle is opened, as the hands that have touched it have left contamination. No milk should be left on the outside of a bottle returned to the refrigerator.

Effect of Heat on Milk. Part of the protein in milk is, like the white of the egg, coagulated by heat. The rest is not so affected, but is curdled by acid. The portion affected by heat is called albu-

men; that curdled by acid and rennet is casein. Heating milk destroys the ferments and the greater part of the germs present, and is the simplest method of preservation. If there is any doubt about the purity of milk given children or invalids, it is safer to sterilize or pasteurize it.

Milk or cream is considered pasteurized when it has been subjected to temperatures ranging from 160° Fahrenheit to 185° Fahrenheit for thirty minutes. These temperatures are below the boiling-point of water (212°), but at 167° most disease-germs are killed. Moreover, the albumen is not coagulated, as it is at the boiling-point. A convenient way to pasteurize the baby's milk is to stand the bottles of milk, with stoppers of absorbent-cotton, in boiling water. The bottom of the bottle must not touch the bottom of the kettle, as it may break. A piece of wood or a rack in which to set the bottles will serve to prevent this. The milk in the bottle does not reach the boiling-point, which is the temperature of the water in which the bottles stand. After the bottles have been in the boiling water thirty minutes the kettle is removed from the fire and the bottles cooled quickly in the water.

Sterilization. To boil milk is to sterilize it, which means make it free of all germs. In boiled milk changes are produced that in the opinion of many scientists make the milk more difficult to digest.

Modification of Milk. As has been said before,

cow's milk is the best substitute for mother's milk, but for babies and for young children it must always be "modified." This means making changes by adding water, lactose (milk-sugar), cream, and sometimes lime-water. The proportions are varied according to the age of the child. It is best to have a doctor's prescription in each case. It is particularly important that the baby have enough mineral matter, and the milk must be diluted intelligently so as not to reduce this. The growing bones will not strengthen without enough mineral matter of the right kind. The many books on infant diet treat of this important subject at length.

Invalids. Because milk is easily digested it is given the sick, particularly to those who need to have their bodies built up and strengthened. Milk warmed to body temperature—that is, when a drop feels warm (not hot) to the wrist above the pulse—has a quieting, soothing effect upon the tired and worn-out nerves. It is a much safer and better sedative than any drug. When the head of a sleepless and tired person is cold, the effect of a drink of warm milk is magical.

When people cannot take sweet milk they can often take the fermented milks, buttermilk, sour milk, koumys, matzoon, kefir, leben, or one from the host of commercial sour milks. These are milks which have been soured by a ferment, such as are formed by yeasts and bacteria. The cheapest of these are buttermilk and sour milk.

Almost all large dairies now supply buttermilk. Natural buttermilk is the liquid left when the butter has come from the cream, and is to most people a delicious drink, especially if very cold. Most of the buttermilk on the market, however, is "artificial"—that is, milk soured by a ferment added for the purpose. This is as valuable for food purposes, but to most people not so palatable.

Koumys is a fermented milk, which was originally made from mare's milk, but is now made with cow's milk. To a quart of lukewarm milk is added one-sixth of a yeast cake dissolved in some of the warmed milk with one and one-half tablespoonfuls of sugar. This is poured in clean, well-boiled-out bottles, and kept at a temperature of 70° Fahrenheit for twelve hours, then put in the lower part of the refrigerator. This koumys is ready to drink in twenty-four hours.

If the highly charged koumys made in this way is not liked, a similar drink with no effervescence can be made as follows: In a covered receptacle bring a quart of milk to the boiling-point. Do not allow to boil; keep it at this temperature for ten minutes. (The surface of the milk should steam freely and should simply be circulating, not in a state of active ebullition.) This kills the majority of the bacteria in the milk. Keep covered closely, only removing the cover gradually and very quickly to ascertain the condition of the milk. Next allow to cool to body temperature or lower, then add two ounces of zoolac or other

commercial milk. To add the zoolac, pass the opened mouth of the bottle quickly through the flame of an ordinary gas-burner. Insert the neck of the bottle under the edge of the lid of the receptacle containing the milk and pour out two ounces. Replace cover quickly, and do not again raise it until the souring period is completed. Keep the milk in a warm place near a radiator or stove, where for from eighteen to twenty hours it will receive a temperature of about that of the body. Lastly, the container should be placed, when the process is completed, in the ice-box, preferably directly on the ice. This measure causes the curd to contract, and the whey is thus squeezed out. The whey may be discarded if it is desired to have less lactic acid present. The remaining curd may then be beaten up with an egg-beater into a thick cream, or it may be eaten like junket.

These fermented milks are held by many scientists to have a beneficial antiseptic effect upon the intestines, and are recommended to people suffering from intestinal disturbances. They work as purifiers, destroying the bacteria which cause putrefaction. These milks are sour because of lactic acid produced by certain bacteria which feed in the milk-sugar. Their therapeutic value is based on the fact that many disease bacteria and most of the putrefactive forms are either killed off or prevented from growing by reason of the presence of the lactic acid.

Cream. This is the fat of milk, which rises to the top when the milk stands. In cream there is a small proportion of mineral matter and protein with the fat. Cream is one of the most easily assimilated fats, and one of the most expensive. Less intelligence is exercised by the housekeeper in the use of cream as food than in the use of many other foods. The youth who outgrows his strength should be enticed to eat all the cream he will. The tired and worn nerves of the exhausted professional or business woman need this easily digested fat. The happy, stout, hearty people can be fed on a less expensive food and thrive.

Cream adds flavor as well as food value to the meal, and is an acceptable addition to many dishes. Different thicknesses of cream can be obtained from the large dairies. A thicker one is needed for whipping than is otherwise necessary.

Sour Cream. This should never be thrown away, as it may be used to advantage. It may be eaten as clabber by those who like it. Cookies, cake, and molasses-cake are more delicious when made with sour cream. (See also Chapter VII.)

Skim-milk. This is the milk from which the cream has been taken off. It is still a valuable food, although it has lost the fat of whole milk. The quality of skim-milk varies with the way the cream has been separated from it. In the machine separators little or no fat is left. When the milk stands, and only the cream which rises

to the top of the milk is taken off, some fat remains in the skim-milk. Where great economy is necessary, skim-milk can be used for cooking and even drinking. When this is done extra fat must be provided in the diet to make up for that lost from the milk.

Bread, biscuits, griddle-cakes, and cake can be made with skim-milk, as can the cream soups. If skim-milk is bought, special care must be taken to get clean, pure milk. Because it is a cheaper article it does not always receive the care necessary to protect it from dirt and disease germs. Skim-milk sells for little more than half the price of whole milk, and has lost only its fat. It is a valuable article of food at a small price.

Milk Dishes. Milk soups give an endless variety of nutritious dishes. They have as a common basis milk slightly thickened and seasoned. When skim-milk is used, an addition of butter greatly improves the flavor. The butter may be omitted with whole milk.

The cream or milk soups flavored with vegetables are referred to in Chapter VIII. Fish and oysters, crabs and lobsters make equally delicious milk soups. Milk warmed to blood temperature and thickened by the addition of rennet is called junket. It is easily digested, and when served icy cold very delicious. Rennet is a ferment found in the stomach which acts upon warm milk. Junket tablets are a commercial form of rennet, extracted from calves' stomachs, and are very

convenient to use. If milk is heated too hot (above body temperature) the rennet will not solidify it. Corn-starch puddings are made of milk thickened and seasoned. (See "Sauces," Chapter VIII.) To make a smooth corn-starch pudding the corn-starch is blended with cold milk, and this added to the heated milk and cooked. Or the corn-starch and sugar are mixed together before adding to the heated milk. In either case they must be thoroughly cooked. Raw starch is neither delicious in flavor nor digestible.

Custards. These are milk-and-egg mixtures, and very nutritious. To be delicious they must be cooked at a low temperature, and this is best done over hot water in a double boiler.

Cheese. Cheese is made of the curd and fat of milk. The varieties of cheese differ in the amount of fat they contain, in consistency—hard or soft—and in flavor.

Composition. When it is realized that the protein of milk is in the curd from which cheese is made it is readily seen that cheese is a highly concentrated food. The comparison of the price of meat and cheese shows cheese to be the cheaper form of protein. However, the variety of cheese chosen makes a difference in this comparison of food values.

A skim-milk cheese contains less food value than one made from whole milk. Canadian, Dutch, and American cheese, when properly made

of the curd of rich whole milk, are inexpensive protein foods.

Digestibility. Cheese is slow to digest, not indigestible. The reason why the digestive juices act slowly and with difficulty upon cheese is probably because the fat in the curd acts as a waterproof covering, preventing the access of the digestive juices. When the cheese is broken in small pieces before eating, it is more easily digested. A mechanical aid to its digestion is to grate the cheese and mix with other food.

A little baking-soda added to cooked cheese dishes will also help the action of digestion. It is only in the stomach that the difficulty of digesting cheese occurs. Once in the intestines, it is as easily and as completely absorbed as meat. Because cheese requires a vigorous, healthy digestion it is not a good food for young children or delicate people. It is an economical and nutritious food for the hearty outdoor worker. Cheese costs, for the same protein value, about one-sixth the price of meat.

Every housewife should have Farmers' Bulletin 487 of the United States Department of Agriculture on *Cheese and Its Economical Uses in the Diet.* This can be had free on application, and contains information as to the food value, digestibility, variety, and methods of cooking this valuable food.

Eggs. All the dairy products are staples in the household food-supply, and eggs are a necessity

with the American family. Those who live in the country know the deliciousness of new-laid eggs, but the "fresh" egg of the city store is quite a different matter. However, its value as food and its use are the same. The thrifty housekeeper who has space and can buy really fresh eggs in the season when eggs are lowest can save much by storing them until the time of high prices, as described later. The average city dweller who wishes to be economical will learn to judge where the egg must be used and when it may be omitted.

Composition. From the egg comes the little chick, and closed within the egg-shell are all the materials needed to build the body and sustain the life of the baby chick until it is hatched. It is a valuable food for the human body as well. In the egg there is much protein, mineral matter (particularly lime, phosphorus, and iron), and fat. The white of the egg is three-quarters water, in which is discovered an easily digested protein called egg-albumen. The yolk of the egg contains much more material than the white, quite a large proportion of which is fat. Some of the fat is like that found in other foods, while a small part is a fat found only here and in nerve tissues. There are also several kinds of protein in the yolk and a number of different minerals.

It is interesting to note that the iron as it is found in eggs is more easily taken into the blood than iron given in other ways. This fact is made use of by physicians, who have enlisted the farmer

to co-operate with them and by feeding the hen food rich in iron to get eggs containing more of this valuable mineral.

The nutritive value of eggs is due largely to protein and fat. To compare eggs and milk, one egg and a half-glass of good milk are about equal. To equal the food value of one pound of medium fat meat, about ten eggs are needed. It has probably been noted that eggs contain no starch or sugar. It is for this reason that some starchy food, such as bread, should be eaten with them to make a complete food.

Selection. Eggs vary so much in size that it is better economy to buy by weight than by number. Eggs from well-fed hens are more nutritious than those from poorly fed hens. The color of the shell is no indication of the food value of the egg, although Boston families will pay more for eggs with brown shells and New York families more for eggs with white shells. There are a number of tests to determine the freshness of eggs. The simplest test is to try them in water. Those that sink are fresh, the ones that float are stale. "Candling" eggs is another method of testing. Each egg is held between the eye and the flame, and any showing a dark spot is rejected.

Care. Because the egg-shell is porous, eggs will become flavored if other foods are stored near them. The fresh-laid egg has a tender membrane coating protecting the pores of the shell. Washing the shell removes this protection. It is

therefore important that eggs come from well-cared-for farms where the nests are clean. They should be washed just before using, but not before. It is an economy to buy eggs when they are plentiful and cheap and store them. This can be done in several ways. The methods recommended by the United States Agricultural Experiment Stations are either to coat the shell with vaseline and store in a cold place or to pack them in water-glass.

Water-glass is a chemical solution which can be bought at any drug-store and many country grocery-stores. It costs about twenty cents a quart. One and one-half quarts of the water-glass solution are mixed with eighteen quarts of boiled water. This is stirred until thoroughly dissolved. This quantity is enough for two eight-gallon stone jars. The eggs are laid in this solution, packed as closely as possible, and may be added in small quantities as well as in large quantities. These two jars will hold thirty dozen eggs.

It is essential that everything be perfectly clean and that perfectly fresh eggs be used. There should be at least two inches of the liquid over the top layer of eggs. The jars should be covered to prevent evaporation and kept in a cool place. Eggs stored in this way will keep a very long time. They should be taken from the liquid just before using, and then if the egg was fresh when put in it will be fresh when used.

Cooking. Heat changes the contents of the egg

to a solid. Too hot a temperature produces a tough mass which takes longer to digest than the more tender solid produced when eggs are heated below the boiling-point of water—212° Fahrenheit.

Eggs cooked in any way are digested by most people, although there are a few people who cannot eat eggs in any form. For the large majority who can eat eggs they are more quickly and easily digested when cooked at a low temperature. To cook eggs "soft" they should be dropped in enough boiling water to cover them and allowed to stand for five minutes where the water will not boil. To cook "hard" the eggs are covered with cold water and allowed to come to the boiling-point, then removed from the fire and allowed to remain in the hot water twenty minutes. Many people cook eggs in water kept constantly boiling, but this toughens the albumen, so that the method described here is preferable.

The poaching of eggs is most successfully done by breaking the egg in a saucer or dish and slipping it from this into rapidly boiling water. The water is then removed from the fire, and the egg left in until the white "sets." A substitute for the poached egg is one cooked in a well-buttered ramekin or custard-cup. The cup or ramekin is set in hot water in the oven. This dish is called coddled eggs, shirred eggs, or baked eggs.

Scrambled eggs are a delicious creamy dish or a stringy mass, depending upon the intensity of the heat used in cooking them. A safe method is

to cook them over hot water. Care must be taken not to cook them too long. An imitation of scrambled eggs which will not harden can be made by breaking the eggs into a thin white sauce, stirring and cooking to the right consistency. If this is done in the top of a double boiler the eggs can be kept warm and creamy for several hours.

Fried eggs, when properly cooked, are perfectly digestible. To do this a frying-pan is first heated very hot. Butter is placed in this and melted (not burned), then the egg is slipped in and cooked. It may be turned or not, as taste dictates. If not turned, the fat should be dipped up over the egg until a delicate film is formed. Bacon fat is a very good substitute for butter in the frying process.

A puffy omelet is a culinary triumph. The trick in making this is to cook it at a low temperature. If a gas-stove is used the fire must be turned low, and an asbestos mat kept between the fire and the omelet-pan. To keep an omelet over the heat too long is fatal. This coagulates the egg proteins so that the omelet shrinks and shrivels. To take the omelet off the fire too soon is equally disastrous. Under such circumstances the protein is not coagulated sufficiently to be firm, and the omelet on its way to the table may collapse on the dish. After separating the yolk and white of the egg to make an omelet, the white should be beaten until stiff, not *dry*, and the beaten and

seasoned yolks added. Care must be used in mixing the two not to destroy the lightness of the white. The mixture is poured on a well-buttered, hot omelet-pan to cook.

A cook with a deft hand at omelet-making has nothing to fear, and can vary the dish to suit any occasion. A plain omelet or one made with bread-crumbs is more appetizing at breakfast to most people. A sweet omelet is delicious at luncheon. Before the omelet is folded the surface is spread with jelly, jam, or marmalade. Another and more attractive omelet is made by putting thin slices of oranges seasoned with powdered sugar on the omelet before it is folded, and seasoning it with a sauce made of sliced oranges and orange-juice.

A heartier omelet is sometimes desired. This can be made by adding finely chopped meat or fish to the omelet, and serving with a thin white sauce, to which some of the meat or fish is added. This is an excellent way in which to use small amounts of left-over chicken or ham. A plain omelet served with a white sauce to which peas are added has an increased nutritive value.

The food value of the dairy products is so great, and they are so universally liked by man, woman, and child, that they are one of the most valuable assets of the planner of good and nourishing meals.

XI

BUTTER AND OTHER FATS

IN the days when all the industries were carried on in the home, butter-making was one of the most important duties of the housekeeper. The rolls of delicious yellow butter on the shelf of the spring-house made a gratifying sight not only to the butter-maker but to the entire family.

The making of butter was then a part of the training of every girl. There was much good butter, but as much or more poor butter, since the "whys" of the failure were not known. The housewife churned once or twice a week, according to the amount of cream she had collected. If the cream was churned before it had stood long enough to be contaminated by the surroundings, the butter was good; but if there was no suitable place in which to store the cream for ripening, the butter could not be good. It is impossible to imagine a more delicious product than that of the cool, clean spring-houses or the sanitary dairies. But when the milk and cream are kept in a cellar in which vegetables and meats are

stored the milk must have other and foreign flavors.

Present-day butter-making is a science. The United States Government keeps an active supervision over the butter supplied to her citizens, and insists that it shall contain no more than 16 per cent. water and at least 82.5 per cent. (usually 84 per cent.) butter-fat. Every manufacturer is held up to this standard, and fined if he violates the law.

Creamery Butter. There is very little dairy butter in the wholesale market these days. The creamery has taken this industry almost entirely out of the home. Often the creamery is a co-operative business, with all the neighboring farmers as stock-holders, a fact that would naturally make them active in promoting the interests of the plant.

The whole milk is usually sent to the creamery, where the cream is separated by machinery. Sometimes the cream alone is sent, but the farmer should then have a separator. The chance of contamination is lessened by rapid handling, although it should never be forgotten that the great danger of contamination is at milking-time.

Butter-making. It is astonishing how little poor butter, from the point of view of nutrition, there is on the market now. Science and the United States Government do not allow it. The butter-makers understand the reasons for former failures and know how to correct them. They

understand that the first and last word in good butter-making is cleanliness. A clean stable, clean cows, clean milkers, clean utensils, a clean place in which to make the butter, and, last of all, absolute cleanliness in handling it until the last morsel of butter has been consumed—these are the essentials.

The cream for good butter-making must be fresh and sweet. If every precaution is observed, fresh cream may be kept sweet for four or five days if necessary, at a temperature below 50° Fahrenheit. Butter can be made from sweet cream, but the greatest demand is for sour-cream butter.

It may well be asked why, if the butter is to be made of sour cream, there is such an effort to keep the cream sweet. The reason is that the flavor in milk and cream is produced by the presence of bacteria—some producing a desirable flavor and others an undesirable flavor. It is to prevent the growth of the undesirable bacteria that the cream is kept sweet. Then a starter is put into the cream. This is milk soured under clean conditions and not allowed to stand after a certain degree of acidity has been reached. Such sour milk contains the bacteria that produce the desired flavors, and their rapid growth prevents any undesirable bacteria from developing. If the proper flavor cannot be produced in this way, the lactic-acid bacteria themselves are introduced into cream. The pure cultures for this

purpose are usually obtained from Denmark. The cream is allowed to "ripen" until a certain degree of acidity is reached. This is determined by expert testers, or, better still, by chemical tests.

Churning. The churning of the cream is for the purpose of gathering the butter fat into a mass. A little agitation brings the globules of fat together, and they cling to one another. The ball grows larger and larger until one mass of butter is collected. If a housekeeper wishes to demonstrate to herself how this happens she can do so with a very simple device. A quart fruit-jar containing a pint of forty per cent. cream is held in both hands and tossed back and forth gently until the butter collects. If this is done under proper conditions there should be a half-pound of butter.

Working. When the butter is collected the process is only partly over. The buttermilk and water must be worked out of the butter. This is more completely done by machinery than by hand. If much buttermilk is left, the butter does not keep as well as when it is worked out. The proteins in the butter furnish food for the growth of the bacteria that change the flavor. Naturally, a butter with a high percentage of moisture contains less butter fat to the pound than one with sixteen per cent.

There is on the market now a device to increase the bulk of butter, by which a certain amount of milk can be beaten into a given weight of butter. This increases the volume. It is, of

course, for use in the home only. No dealer would be allowed to sell butter with the per cent. of fat so reduced and the per cent. of moisture so increased.

Salting Butter. If salt is to be added to butter it is done when the buttermilk has nearly all been worked out, or else much of the salt would be dissolved in the liquid and lost. Salt is used as a preservative as well as a flavor.

Some expert authorities on butter-making maintain that the preservative qualities of salt have been exaggerated. According to their experiments, unsalted butter, if handled properly, keeps longer than is commonly supposed. There is some demand for unsalted butter in this country—mostly in large cities—but not so great a demand as there is in Europe. In most European countries salted butter is rarely used. There it is possible to buy small amounts so as to have it fresh every day.

Packing. Whether or not salt does help to preserve butter, it still is used if butter is to be kept any length of time. Not only is the butter well salted, but it is covered with generous amounts of salt. Where large quantities of butter are packed, great care is used to crowd out all air spaces, as the bacteria inclosed in the air are one source of trouble.

The wholesale dealers keep their butter in a refrigerator-plant with the temperature between 5° and 10° Fahrenheit below zero. At this tem-

perature the butter is frozen solid, and it is contrary to all the laws of natural science that bacteria should grow at that temperature. No harm, then, can come to the butter in cold storage; but if it is not well cared for when it is taken out, disaster follows. If it is kept in too hot a room it deteriorates. Beware of butter taken from a tub kept outside the refrigerator in a hot store.

Tub and Print Butter. Butter is usually sent to market in a tub. There is a great demand for print-butter. The wholesale dealer either has a machine for this, or he sends his tub-butter to some one who has. Print-butter usually costs a few cents a pound more than tub-butter, but it is worth the difference. The prints are done up in oiled-paper, protected from the air. In this compact form they cut to greater advantage, so there is no waste. Once a tub is opened, it is difficult to keep it from contamination, and the amount which clings to the side of the tub with the amount made unattractive by handling make up a heavy loss.

Process Butter. According to statistics, more than a billion pounds of butter are made on the farms in this country. Unfortunately, much of this cannot be sold as butter. The amount that lacks the sweet, delicious butter flavor is sent to a renovating-plant. Renovated or process butter is an American invention, first used in 1883. In 1905 there were seventy-eight factories manufacturing 60,000,000 pounds every year.

Undesirable dairy butter is melted and all impurities drawn off. The pure butter oil is then treated with blasts of clean hot air. As the hot air is pumped through the butter fat it carries with it any volatile substances and leaves the butter fat free from disagreeable odors and flavors.

This is churned with good fresh milk that has been soured by lactic-acid bacteria. This process adds the characteristic butter flavor. There is nothing in the manufacture of process butter to condemn it; and, as the law requires that it be plainly labeled "Process Butter," the housekeeper is not deceived, whether the butter is in the form of a brick or a roll or is taken from the tub.

If she suspects that the dealer is selling process butter for fresh butter a very simple test will set her right. Heat about a quarter of an ounce of the butter to be tested in a large spoon over a small flame. Genuine butter will boil quietly, but with considerable froth and foam. Process butter, or oleomargarine, will sputter noisily, but will not foam much. The curd in fresh butter will be small and finely divided, while in the process butter it will be in large lumps. This is called the "spoon test."

As the disagreeable odors and flavors in old, rancid butter cannot be driven off, this cannot be converted into process butter. It is fit only to be used in soap-making.

Other Fats. There are a number of manufactured products on the market, some of which

take the place of table butter, and some may be substituted for butter in cooking.

Oleomargarine is the best of these manufactured products, as to the better grades of this some butter or cream is added. The history of oleomargarine is interesting. It is said that during the Franco-German War of 1870 Napoleon III. requested one of the French chemists, M. Mege-Mourier, to find a good wholesome cheap substitute for butter, so that the expenses of the war might be reduced. In a short time he submitted a product which so closely resembled butter that it required an expert to distinguish it.

The prejudice in regard to oleomargarine probably arises from the fact that there are inferior qualities upon the market. It would be a good thing for a housekeeper who is forced to economize to experiment with a good quality of oleomargarine and decide for herself whether the prejudice in regard to it is well founded or whether it is based only upon popular opinion. In the average family no member would notice the difference if oleomargarine were substituted for butter without any announcement of the fact.

The best oleomargarine is made of refined beef fat or lard, into which milk or cream is churned. The process must be carried on under sanitary conditions, because here, too, the Government exercises supervision. A heavier tax is imposed on colored oleomargarine than on uncolored. It is unfortunate that this is the case, as the white,

fatty mass of the uncolored oleomargarine is unappetizing to those who like it when colored, and there would be a greater use of it, and a consequent greater saving to the family, if the tax could be entirely removed.

All institutions, hotels, restaurants, and boarding-houses are prohibited from buying uncolored oleomargarine and coloring it, and they are also obliged to have in sight of their patrons a placard upon which is plainly printed the fact that they use this substitute for butter. This is not because the substitute is harmful, but so that the patrons may know what they are eating, and need not pay the price of butter. The price of "oleo" varies only a few cents throughout the year, and at all times it is much cheaper than butter. The test for oleomargarine is the "spoon test" given for process butter.

The other manufactured products have no butter fat, and many no animal fat. They are made of vegetable oils and nut oils. The oils most frequently used are those of cotton-seed, peanuts, Brazil nuts, cocoanuts, and maize. These may safely be used in cooking, especially in the preparation of foods with distinct flavor, where the lack of butter flavor is not conspicuous. In flour mixtures, spices or molasses easily conceal the lack of butter flavor. The use of these fats is one way in which economy may be practised without sacrificing the pleasure of the household.

The other fats are distinctly cheaper than oleo-

margarine, ranging from fifteen to twenty cents a pound. It is always worth while for the thrifty housekeeper to experiment with each of these, keeping careful count of the amount saved. Often if the cook does not tell the family that she is using one of these manufactured fats they are none the wiser, since only the rare individual has a taste acute enough to detect the absence of butter flavor. Good clean drippings of any kind, if well tried out, may be used in cooking. As has been suggested in Chapter VI., chicken fat, beef fat, and bacon fat all have a place in economical cookery.

Lard is another fat with possibilities. This is used very generously in country communities, where it is obtained fresh and cheap. For the city dweller lard is more expensive and not always satisfactory.

Salad oils. Although olive oil is not used much in this country for cooking purposes, it is very generously used for salad dressings, and so deserves a place in this chapter.

The finest olive oil is made from hand-picked, peeled, ripe olives from which the pits have been removed. An inferior quality is made from the whole olive, including the pit; and still another grade is made from the pits or kernels ground into a coarse meal and subjected to pressure. Olive oil is also adulterated, the most common adulterant being cotton-seed oil.

To test olive oil for an adulterant, take equal

volumes of oil and concentrated nitric or sulphuric acid. Shake or stir the two together. When pure olive oil is used the mixture turns from a pale to a dark green color in a few minutes. If a reddish, orange, or brown color is produced the presence of a foreign oil is indicated.

There are various other salad oils on the market, some of them good and some poor. If the better of these are used a more agreeable flavor is obtained in the salad dressing by using half vinegar and half lemon-juice. Usually it is necessary to add more salt to another vegetable or nut oil than to olive oil.

Food Value. Butter and oils add practically nothing to the diet except fat. So little is definitely known of the comparative digestibility of vegetable and animal fats and oils that no general statement can be safely made regarding the food value of the former.

No better statement regarding the nutritive value of butter can be made than that given by Larson and White in *Dairy Technology:* "Butter is one of the most important sources of fat in our diet, one of the most palatable and easily digested. According to recent statistics, butter constitutes about two per cent. of the total food, and furnishes 19.7 per cent. of the total fat in the average American diet."

In the use of butter and other fats the housekeeper who wishes to economize ought not to condemn a product until she has informed herself

as to its manufacture. If she is satisfied with that she can then experiment to find out exactly what she can do with it in cooking. The state chemist or the Experiment Station at Washington will give information as to the purity of any food product. Butter or so-called butter substitutes are indispensable in the diet, and the housekeeper must be wise in their selection and use.

XII

WHY MEAT IS IMPORTANT

EVERY American family, except the small band of vegetarians, eats meat at least once a day when the family purse can afford it. So universal is this practice that men are said to fast or to abstain when they go without meat, yet eat other foods. Meat in this day and generation is largely the flesh of animals especially bred and raised for food.

The romance of the history of the English-speaking nations is connected with the names of the animals used for food. The Anglo-Saxon calf and cattle of the field is the Norman veal and beef of the table, the Anglo-Saxon sheep of the pasture is the Norman mutton served to be eaten, Anglo-Saxon pig of the forest and sty is the Norman pork when it has been prepared for cooking. To what extent the eating of the flesh of these animals has had influence in making the race leaders in enterprise and endurance is a question difficult to decide.

The questions which demand our attention are, how much meat each individual needs and how

to provide this on the family income. The first thing the planner of meals needs to know is the food value of meat.

Composition and Nutritive Value. Meat as we buy it is made up of lean or muscular tissue, connective tissue or gristle, fatty tissue, blood-vessels, nerves, and bones. In the muscular tissues are found different proteins. Physiological chemists and dietitians are studying these different proteins, and it is hoped that the promised results of their present experiments will lead to answers to many of the perplexing questions on feeding and diet.

From the protein foods are formed the muscles, the connective tissues, the skin, hair, and the major part of the secretive and excretive organs. Protein can also serve as fuel for the body, or, in other words, as a source of energy.

The relative efficiency of the animal and vegetable proteins is still waiting to be decided beyond question. The housekeeper cannot wait for these promised results, but must meet the problem today. She may count on the following statement of fact, as far as it goes. Most authorities agree that flesh foods are relatively more economical for tissue formation than are vegetable foods. The rapidly growing body of the youth must have sufficient protein to build a strong, healthy body. The adult needs it only to repair worn-out tissues, when other foods are given to produce energy.

The present knowledge of the nutritive value

of protein incites a demand for definite tables, by which the true economist may fix the quantity of protein needed for the youth, the aged, the active worker, or the student. Rather indefinite advice is now given. Young children and the old are healthier when allowed very little meat. Authorities generally agree that meat three times a day is an extravagance for any one, yet many families still follow this rule.

The following facts are also well established. The extractives of meat—that is, the juices, the part contributing flavor—have no independent food value, but act upon the digestive system in such a way as to make other foods more thoroughly digested and utilized by the body. The gelatine, made from gristle and bone, is what is technically called a protein sparer, or, as a public school-girl interpreted it: "Gelatine won't make you fat, but it will keep you from getting skinny." The meat of young animals contains less extractives and more gelatine-forming material than does that of the older animals. The composition of meat is affected by the age, sex, breed, and food of the animal.

Meat in the Dietary. A discriminating judgment is needed to decide just what true economy is in the purchase and preservation of meat. How much meat do the different members of the family need to obtain the best results in health and vigor? A great many families are getting more meat than they need. Other less expensive

foods could be substituted for part of the meat, or a simple cutting down of the quantity of meat eaten would result in better health.

Where the housekeeper lacks scientific training to decide this difficult question it will pay her to consult a trained dietitian. Both the underfeeding and the overfeeding of this important food —meat—bring sad results.

Selection. For the cook, the meat from all these animals may be divided into two classes—tough meat and tender meat. Almost at a glance any one looking at a picture of the beef animal, the pig, and the sheep will see how closely these skeletons resemble one another. The cook who studies the skeleton and adhering flesh of one animal will find that she knows them all.

The muscular tissues of the meat are arranged in tube-like bundles, held together by thin, transparent, elastic skin. About the legs, neck, and much-exercised parts of the animal this connecting tissue is tougher than where the flesh acts as a cushion or protection.

To sum up, the tougher cuts of meat come from the part of the animal which is most active. The tender cuts of meat come from the less-used parts of the animal. The toughness and tenderness are due to the connective tissue, which holds the muscle fiber together. Fat is closely associated with the muscle fiber. The various protein constituents which go to make up the muscle fiber do not differ in tough and tender meat. The

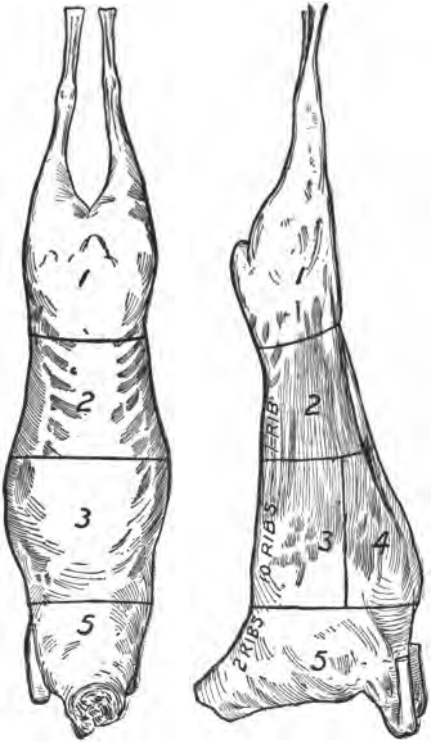
tough meat may have more flavor than some of the more tender parts.

Cuts of Meat. The dead animal is cut down the back, the body being thus divided into two identical parts, called sides. These are then divided into fore and hind quarters. The further division of meat differs somewhat for different localities. The diagrams give the usual divisions. By the aid of these illustrations a housekeeper can make herself intelligent and can then learn from a local butcher just how the meat is cut, and the comparative cost of the different cuts.

Beef. Good beef is purplish red when first cut, the surface becoming bright red and moist on exposure to the air. It should be firm and elastic to the touch. The more tender cuts are fine-grained and well mottled with fat. The fat should be light straw-colored. Beef with yellow fat is poor.

Veal. The meat of this immature animal does not keep as well as the meat of mature animals. The flesh should be light pink, as nearly white as possible, containing an abundance of "baby fat" and free from spots. The bones should be small, the back-bone and breast-bone soft and red. The best veal is from calves from four to eight weeks old.

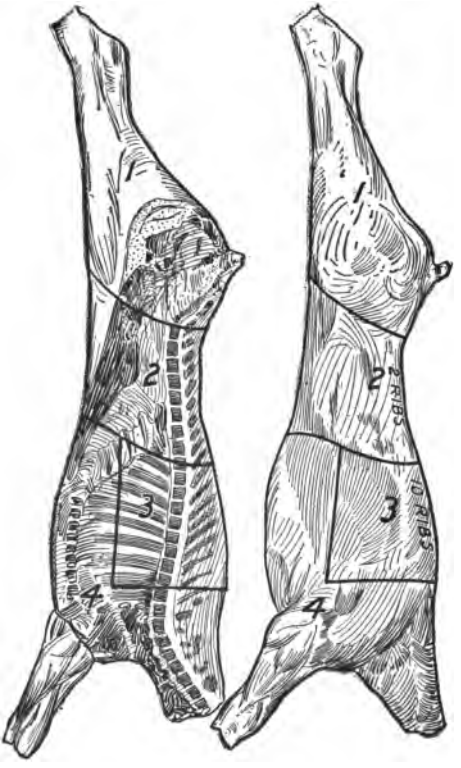
Mutton and Lamb. The good meat is firm and fine-grained. Stringy, coarse meat means that the sheep was aged or infirm. The color of the flesh varies from light pink in lambs to dull red



MUTTON AND LAMB CUTS

1, 2.	Saddle	1.	Leg	4.	Breast
3, 4, 5.	Rack	2.	Loin	5.	Chuck
1, 2, 3.	Long saddle	3.	Short rack	4, 5.	Stew
2, 3, 4, 5.	Body	2, 3.	Back		

From the University of Illinois Agricultural Experiment Station Bulletin No. 147.



VEAL CUTS

1, 2.	Saddle (or 2 hind quarters)	1.	Leg
		2.	Loin
3, 4.	Rack (or 2 fore quarters)	3.	Ribs
		4.	Stew

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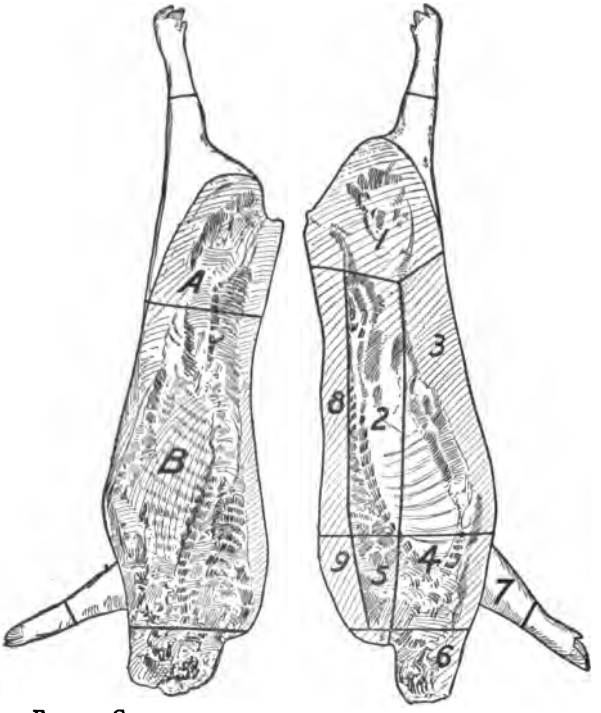

ENGLISH CUTS

A. Long-cut ham
B. Long side or middle

DOMESTIC CUTS

1.	Short-cut ham	6.	Jowl	2, 3, 8.	Side
2.	Loin	7.	Hock	4, 7.	Picnic shoulder
3.	Belly	8.	Fat back	5, 9.	Shoulder butt
4.	Picnic butt	9.	Clear plate	8, 9.	Long fat back
5.	Boston butt	2, 8.	Back	4, 5, 7, 9.	Rough shoulder

PORK CUTS

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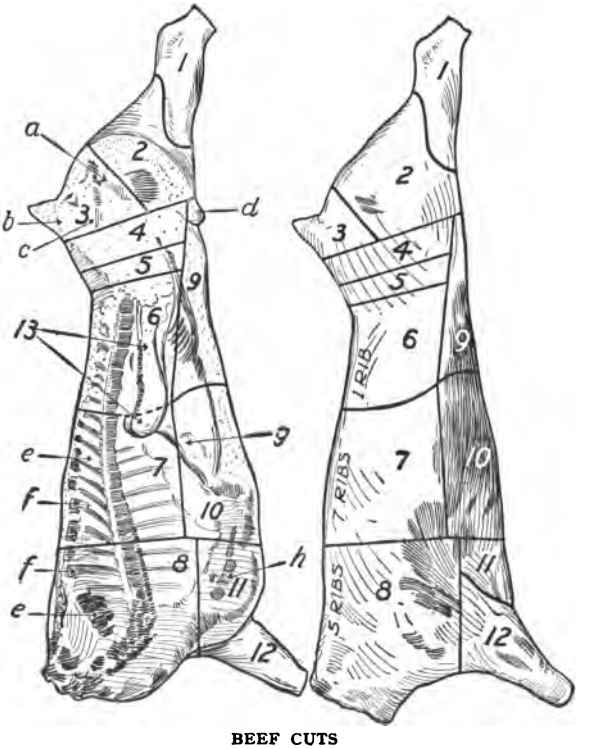


BEEF CUTS

1, 2, 3.	Round	1.	Hind shank	1, 2, 3, 4, 5, 6, 9.	Hind quarter
4, 5, 6.	Loin	2.	Round, R. & S. off		
7.	Rib	3.	Rump	7, 8, 10. 11, 12.	Fore quarter
8,	Chuck	4, 5.	Loin end	7, 8.	Back
9.	Flank	6.	Pinbone loin	7, 10.	Piece
10, 11.	Plate	5, 6.	Flatbone loin	8, 11, 12.	Kosher chuck
12.	Shank	10.	Navel	8, 10, 11, 12.	Triangle
13.	Suet	11.	Brisket		

a. Aitch-bone; *b*. Rump-bone; *c*. Crotch; *d*. Cod; *e*. Chine-bones; *f*. "Buttons"; *g*. Skirt; *h*. Breast-bone

From the University of Illinois Agricultural Experiment Station Bulletin No. 147.

in mature mutton, the fat always being clear and white.

Pork. A large proportion of the pork animal is used to make cured and manufactured products, such as hams, bacon, sausage, and canned meats. Hogs are more subject than other food animals to diseases that affect the value of the meat. Good fresh pork has firm, bright, smooth-grained flesh, solid, white fat, and smooth, thin, mellow skin, free from wrinkles, blotches, or bruises. The curing of hams and bacon affects the taste greatly, and for fine-flavored results a good price must be paid.

Organs used as Food. The organs of the following animals are used as food as follows: the heart of beef; the liver of beef, calf, and lamb; the thymus gland or pancreas of lamb (sweetbread), the brains of the calf, the kidneys of sheep and lamb, the stomach of beef (tripe). Pigs' heads, knuckles, and toes are also considered delicate eating by many people.

These organs decompose more quickly than does the flesh of animals, and they should be selected and kept more carefully.

The ox heart is cheap, and very good when carefully prepared. Because of the long cooking required, a fireless-cooker should be used when gas or electricity is the fuel. In cities and some parts of the country where the demand is large, sweetbreads are costly. Calf's brains can be cooked in the same way as sweetbreads, and are

much less expensive. Calf's liver is also expensive, and lamb's liver makes an excellent substitute.

Poultry: Composition. In the chicken, fowl, capon, and turkey the fat is not so closely associated with the flesh as in the meats from other animals. This is one reason that it is more easily digested. Tame ducks and geese are more difficult of digestion because of the larger quantity of fat.

Selection. A tender chicken is known by soft feet, smooth skin, and soft cartilage at the breast-bone. A fowl has hard, dry feet, stiff breast-bone, and hairs instead of pin-feathers. A turkey should be plump, with smooth, dark legs and a soft, pliable breast-bone. Most people prefer the cock turkey to the hen turkey. Ducks and geese should be plump, and have soft feet and pliable bills. The best abound in pin-feathers.

When cold-storage birds must be used, the buyer should insist on having them direct from the cold-storage plant, refusing those that have been thawed out and refrozen. In cities or towns where there are orthodox Jewish (kosher) markets the buyer can always be sure to get fresh-killed poultry, as no cold-storage poultry may be sold in such a market.

Preparation. Any butcher will dress poultry, but the process is not often thorough. The cook should clean the inside of the bird by allowing cold water to run through it. The bird must not soak in water. If there is a disagreeable

odor, soda should be put in the washing water and charcoal sprinkled in.

Poultry should be cooked either immediately upon killing, or, preferably, after being kept for two or three days. A few hours after death the muscles become rigid, and they do not soften again for at least twenty-four hours. If cooked during this time, the bird will be tough. To be tender it must be cooked either before this rigidity sets in (perhaps within an hour) or after it has vanished.

Cooking of Meat. The effect of heat on the bundles of muscle-fibers is to harden them and develop flavor, while the effect of heat upon the connective tissue is to soften it. These two parts of meat, so closely associated, are affected by heat in different ways. It is for this reason that the perfect cooking of meat is an achievement requiring intelligence and skill. One reason why all kinds of meat are cooked is to kill bacteria and parasites, heat being the best-known purifier.

Broiling. Tender cuts of meat should be cooked at a high temperature for a short time—for instance, broiling, cooking directly over red-hot coals. The very best broiling-fire is made of charcoal. The meat is turned so that alternate sides come next to the hot fire. This is easiest accomplished by placing the meat on a wire rack with handles which allows of its being easily turned. Any tender cut of meat may be broiled, although those most commonly cooked in this

way are the less thick cuts, such as steaks, chops, cutlets, spring chicken. Better results are obtained with a very thick steak or chicken if, after browning well on both sides, it is set in a very hot oven for ten or fifteen minutes to finish the cooking.

Pan-broiling. This differs from broiling directly over the coals in that the meat is cooked on a very hot iron skillet. As all good housekeepers know, only enough fat is used to keep the meat from sticking to the pan, and the pan is kept very hot during the whole operation. The meat is turned frequently to prevent burning and the loss of juices. When the juices begin to run out of the meat, if it is turned in this way the juices are retained.

Roasting. In these days this means cooking in a hot oven. Formerly, roasting also was cooking before an open fire of hot coals. The prime rib, spare rib, fowl, or other tender cut of meat to be roasted is put into a very hot oven. If a regulation covered roasting-pan is used the pan is covered as soon as the meat is well browned. Then the heat of the oven is reduced to about 240° Fahrenheit for the final cooking.

Some cooks rub flour and salt over the outside of the meat before placing it in the oven. This hastens the forming of the brown crust which holds the juices in the meat. To obtain the best results, water should not be put in the pan in which the tender cuts of meat are to be roasted.

The family taste must decide time of cooking. (See table at end of chapter.) The epicure demands that the juice run red as the knife cuts into the meat. A good test is to thrust a metal skewer through the thickest part of the roast. If it comes out warm, it shows that the heat has penetrated to the center of the roast. Poultry roasted without stuffing is more delicious than when stuffed, because the birds can be cooked more quickly and are therefore more juicy. If stuffing is liked, it should be cooked in the roasting-pan at one side, not in the bird.

When an uncovered roasting-pan is used, the roast should be basted often, either with the meat-juice from the pan or with a mixture of hot water and melted butter. A ham is delicious if boiled first, stuffed, and then baked. The stuffing is made as for fowl, finely crumbed, dried bread seasoned and slightly wet with melted butter. Holes are made in the ham with a carving-steel, about two or three inches apart, and these are filled with the stuffing.

Stewing. The tougher cuts of meat should be cooked at a low temperature for a long time. Cooking over a very hot fire long enough to soften the connective tissue renders the muscle-fiber tough and tasteless, while long, slow cooking softens it without this disadvantage, and is best accomplished in or over water at a low temperature.

There are two methods of cooking the tougher

cuts of meat in water, depending upon whether the object is to keep the juice in the meat, as in a stew, or to draw the juices out into the water, as in soup.

When the juices are to be kept in the meat it is seared by browning before putting it in boiling water. A stew made in this way of pieces of well-browned meat, simmered in boiling water, will be tender and delicious. The same method makes a leg of mutton or a pot-roast of beef to compare with the more superior cuts of meat. All of these dishes, such as stews, pot-roasts, ragouts, and the like, require careful seasoning. Vegetables cooked with meat impart their flavor to it. Peppercorns, bay-leaf, and celery-seed add interest and flavor to the dish as a whole.

Braising. This is one of the most economical methods of cooking the tougher cuts of meat. The meat is usually first sautéd to prevent the escape of the juices, then placed in a pan with a small quantity of stock or water, vegetables, and seasoning. A cover prevents the escape of steam. The cooking is done at a low temperature for a long time. A part of an old saying is, "Turkey braised, the Lord be praised." Casserole cooking is one form of braising. The casserole is described in Chapter XVIII.

Any of the roasting or stewing methods of cooking can be successfully carried on in a fireless-cooker. One fact must be kept in mind when meat is cooked in this way—that is, the time that

it is left in the cooker. Meat kept warm—that is, below the boiling-point of water—for a long time will decay. When the putrefaction has gone far, odor and taste warn even the uninitiated. However, the action of decay may have started enough to make the meat unsafe food even when too little gas has been formed to be noticeable as odor or a bad taste developed. Therefore the fireless-cooker must be used for cooking meat with the clock as a necessary adjunct.

Soup. In the second method of cooking meat in water the object is to draw the juices out of the meat, as in soups. The meat is cut in small pieces and covered with cold water, which is heated slowly. By this means a great deal of the meat flavor and substance is drawn out. To extract all that is possible from the meat the liquid must not heat above the simmering-point.

The best soup-pot is an iron one, heated just enough to keep the soup simmering. This slow cooking softens the connective tissue, changing it to gelatine. Gelatine is also cooked out of the bones, which are always used with the meat in making soup. The result of such cooking is called stock. The best soup is made from stock cooked the day before it is to be used, so that it may be cooled, and the fat, which rises on cooling, skimmed off. In summer the cold meat-jelly may be served. For a hot soup the jelly is heated and cleared with egg-white to make clear soups.

Clear soups should be classed under luxuries,

because almost all of the valuable nutritive material in the meat is eliminated. They are palatable and stimulating, but wasteful in preparation, and therefore extravagant.

Meat soups made like a thin stew, where all the meat is served in the soups, are the most economical of the meat dishes, because the cheaper cuts of meat can be used to make them. Many a thrifty mother has fed a large family well on an amazingly small income by serving the cheapest cuts of meat in this way. Cooked until tender with vegetables, barley, and other cereals added, the dish is more nutritious and more palatable than when the meat is cooked alone.

Some of the tougher cuts of meat are made tender by mechanical means; that is, the connective tissue is broken up by chopping or grinding, as in the preparation of Hamburg steak or when a round steak is pounded before cooking. All the cuts from the calf are tender, but because of its immaturity veal is more easily digested when thoroughly cooked. Pork is a meat which requires long and thorough cooking.

Gravy. Advice about cooking meat would be incomplete without a few words about making gravy. Perhaps nothing is produced in the kitchen that differs so in quality, but this should not be true. Accurate measuring will insure good gravy if the simple cooking is done with even moderate care.

After removing a roast from the pan, all but

four tablespoonfuls of fat should be poured off, four tablespoonfuls of flour added, the whole mixed, and a pint of water or stock added with half a teaspoonful of salt and a fourth of a teaspoonful of pepper; the pan is then put over the fire, and the mixture boiled for five minutes with constant stirring. Further seasoning, such as bay-leaf and peppercorn, may be added to taste. Gravy made in this way is as delicious as poor gravy is discouraging to the appetite.

Cost. A much greater variation in cost of the different cuts of meat obtains than their relative value would seem to warrant. This value is fixed by supply and demand. The demand for the more easily prepared cuts of meat is far greater. Therefore the housekeeper with a limited income and time at her disposal will select the cuts which require a longer time in preparation. Often a careless or ignorant buyer of meat does not get full value because she does not demand the trimmings from the roast or chops, or the trimmings, if sent home, are not used. The most common examples of waste of this kind is that of beef-suet. The housekeeper who uses every scrap of fat and suet, carefully trying it out to use as shortening, saves a considerable sum.

The buyer should always remember that she pays for the waste. If all that is cut from the meat by the butcher is sent home with the prepared cut, she can weigh the whole on her own scales and be sure she has had full weight. The

amount of waste that must be paid for is often lost sight of. In some instances this is great. For example, chicken loses much more than a steak, chop, or fish. A chicken weighing, when purchased, 3 pounds 8 ounces, gives 1 pound 14 ounces of eatable food and 1 pound 7 ounces of waste. A porterhouse steak weighing 1 pound 8 ounces gives 12 ounces of eatable food, leaving 12 ounces refuse. A 2-pound-8-ounce Spanish mackerel gives 1 pound 6 ounces of flesh and 8 ounces of waste. There is also a loss in weight because of water which goes off in steam during cooking. This makes chicken at 22 cents a pound cost 41 cents a pound for what the family actually gets, while porterhouse steak at 28 cents a pound will cost 54 cents an eatable pound, and Spanish mackerel at 27 cents costs 49 cents a pound as eaten.

The disregard of these factors when buying has contributed to the despairing cry over the increased cost of living. Food materials have certainly increased in cost with the increasing population. This means that the women of the land must select what they buy more carefully than their mothers and grandmothers did, with a more intelligent knowledge of the needs of the family. It means also that they must prepare the food so that as far as possible what is paid for is used to advantage.

The following tables show the time and methods of cooking meats and poultry.

TENDER CUTS OF MEAT TO BE COOKED AT A HIGH TEMPERATURE FOR A SHORT TIME

BEEF	LAMB	PORK	VEAL	POULTRY	METHOD OF COOKING	TIME
Loin Tip Back of Rump Tenderloin Fillet Prime Ribs	Hind-quarter Loin or Saddle Leg	Shoulder Spare-rib Loin or Saddle	Leg Loin	Fowl Turkey Duck	Roasting	15 minutes to the pound
Loin Sirloin Porterhouse Steak Back Round Tenderloin Steak	Hind-quarter Chops	Chops		Chicken Young Turkey	Broiling	5 to 8 minutes for each inch of thickness

TOUGHER CUTS OF MEAT TO BE COOKED FOR A LONG TIME AT A LOW TEMPERATURE

BEEF	MUTTON	PORK	VEAL	POULTRY	METHOD OF COOKING	TIME
Corned Corned Tongue Fresh Tongue	Shoulder Leg	Ham		Fowl Capon Turkey	Boiling	15 to 30 minutes to the pound
Lower Round Face of Rump	Leg		Shoulder	Fowl Duck	Braizing	40 to 60 minutes to the pound
Aitch-bone Fore quarter			Loin		Stewing	30 minutes to the pound

SOUP-STOCK

BEEF	MUTTON	LAMB	VEAL	POULTRY	METHOD OF COOKING	TIME
Shin	Neck Trimmings		Shin	Fowl	Simmer	One hour to the pound

XIII

FISH AND ITS USES

THE United States Government is spending hundreds of thousands of dollars every year to propagate and protect the common varieties of fish throughout the country. It is doing this in order that this highly nutritious food may be obtained at a reasonable cost and used more often. According to the data recently published by the United States Fish Commissioner, 2,045,000,000 pounds of fish are taken annually from the waters belonging to the United States.

If all the fish not eaten by the fisherman's family reached the market the cost of fish would be much less than it is. Unfortunately, however, many are caught when they are too small and are tossed aside to die, or are caught simply to swell the tale of the fisherman. All of this needless waste affects the market price, and necessitates large appropriations from the government to enforce laws in regard to fishing out of season or marketing under-sized fish.

When there is a government boat in the neighborhood the fishermen are very careful about the

size of the lobsters that they take from the lobster-pots, or in fresh waters they are equally careful of the length of the whitefish, bass, or trout. The government boat cannot be present at every catch of fish, and when it is not there the same care is not always exercised.

Fish may be conveniently classed as salt and fresh water fish. The most common fresh-water fish are whitefish, black and rock bass, lake-trout, brook-trout, and perch. The salt-water fish are more varied and may be divided into fish with scales and fish without scales. Of the scaly fish the white-meated, like cod, haddock, flounder, and smelts, are typical examples. So are the oily fish, of which salmon, mackerel, bluefish, and shad are the best examples. The fish without scales are usually called shell-fish. To this group belong the bivalves—oysters, clams, and scallops—and the crustaceans—lobsters, crabs, and shrimps.

Composition. In composition fish is much like meat, with about the same amount of protein, and as a rule a smaller amount of fat. The fat is distributed differently in different fish. In some it is deposited in the liver, as in the white-meated fish—cod, haddock, and flounder — the meat of which is somewhat dry. In oily fish the fat is distributed throughout the flesh.

Much is said about the mineral matter in fish, the emphasis being laid on the phosphorus; but a comparison of the chemical composition of several foods shows that this idea is based upon

tradition rather than upon fact. The proportion of phosphorus in cod is .4 per cent., salmon .42 per cent., herring .55 per cent. In chocolate it is .90 per cent., in cheese 1.45 per cent., dried beans 1.14 per cent., and in almonds .87 per cent. Meat runs almost parallel with fish, varying from .43 per cent. to .60 per cent., the latter occurring in the ox tongue.

The extractives, which in meat make the delicious soup, occur in fish in small amounts only. In fish the tissue which binds the muscles together is more tender than the corresponding tissue in meat, and therefore it breaks down with less cooking.

It has been generally supposed that because the meat of fish has a short fiber and easily broken down connective tissue it is easily digested. This is a logical theory, but, like all theories, needs much experimentation to prove it. From digestion experiments it seems safe to deduce that as a class fish is easy to digest and that the leaner kind of fish is more easily digested than the fatter.

The one striking exception is lobster. The lobster is a coarse feeder, and therefore the flesh is coarse and dense and difficult of digestion. The flesh of the lobster also disintegrates very quickly after being killed, which is the reason for killing it just before cooking or for killing it by plunging it head first into the pot of boiling water in which it is to be cooked. This is, by the way, not cruel if done properly, as the creature does not have

time to suffer if the head is quickly and completely submerged.

Clams and oysters are more easily digested if eaten raw, but if they have been contaminated by impure water they are apt to carry poisons to the digestive tract.

Oysters when "floated" in fresh or brackish water increase in size, as they absorb large amounts of water. Such oysters must be labeled "floated," as this is counted adulteration according to the federal law and the laws of some states. Shellfish is polluted by growing or floating in impure water, or handling under unsanitary conditions, or packing in unclean receptacles.

Since fish and meat are so nearly alike in composition, they rank the same in nutritive value. They both are valuable in the diet as a source of protein, and under normal conditions of health a person seems to thrive equally well upon fish or meat.

Selection and Care. The general directions for detecting a fresh fish are that the flesh should be firm, the eyes bright, and the gills of a bright-red color. But this is scarcely enough for a person inexperienced in marketing. It is necessary for such a one to go to market and with the aid of the dealer learn how to determine when the flesh is firm and the eyes are bright, or else the purchaser must always trade with an honest man who will tell her when the fish is fresh. A man who is interested in his business is usually willing to help educate his patrons. The housekeeper

alone is to blame if she remains in ignorance and does not interest herself in the food she buys and the place from which it comes.

Fish, unlike meat, must be eaten soon after it is killed, as it deteriorates very quickly. If fish is to be kept any length of time, it must be frozen, a process which impairs the flavor. The danger in fish that has been frozen is not in the process itself, since freezing simply stops the growth of bacteria, but in the possible failure to have the fish fresh when it goes into the freezer. It is hard for the purchaser to judge of this, and a reliable dealer is of particular importance for the buyer of this class of fish.

It is difficult to keep fish in the house either before or after cooking, as the odor is so penetrating that other foods absorb it. If fish is put in the refrigerator uncovered it contaminates all other foods. It is well to have a tightly covered granite pail for this purpose, as fish secured in this way from other food may be safely placed in the refrigerator. Uncooked fish rubbed with salt and secured in this way can also be kept for some days.

Cost. There is nothing in the market except dairy products that fluctuates so in price as does fish. A mackerel which is thirty cents a pound to-day may be thirty-five cents to-morrow, and perhaps next week it will be twenty-five cents a pound.

The price depends upon the supply, which is governed by the catch, except where part of the

catch is held back and frozen. Lobster in December and January may be seventy-five cents a pound and drop to fifty cents a pound in June, and even lower in July and August, depending upon the season and the supply. It is always expensive to buy fish out of season, just as it is to buy fruit or vegetables under similar conditions.

The most expensive fish is not always the most nutritious nor always the most palatable, even though it happens for the moment to be the most popular. A housekeeper who is studying the problem of expense will buy fish in season and never buy until she knows what is the best variety procurable for the money. But if the purchaser says, "When I want lobster I want lobster, and not cod," or "When I want shad I want shad, and not haddock," of course there is nothing for her to do but pay the price demanded.

Another thing which should be considered when buying fish is the amount of waste. A fish with much meat and little bone, even if it is more expensive per pound, may be cheaper in the end because of the small amount of waste material. So-called fillet of sole must necessarily be expensive, since all that is sold the consumer is the thin layer of the flesh of the flounder. The market man must be paid for the rest of the fish which he throws away. Incidentally, in the spring and summer the fillet of sole is not so expensive as in the winter, since during these seasons a plumper fish, the fluke, meets the demand.

Medium-sized shore-scallops are usually sweeter and more tender than the large, deep-sea scallops, and are in greater demand. The small shore-scallops are not especially desirable.

It is of no value to make cost comparisons between fish and meat or fish and vegetables, since the variations in the price of fish are too great. Dr. Langworthy, of the United States Department of Agriculture, has compiled the following table, which is of interest, as showing the comparative cost of different foods and their protein and energy value for ten cents.

COMPARATIVE COST OF PROTEIN AND ENERGY AS FURNISHED BY A NUMBER OF FOOD MATERIALS AT CERTAIN PRICES

	PRICE PER POUND	COST OF ONE POUND PROTEIN	COST OF 1000 CALORIES ENERGY	AMOUNT FOR TEN CENTS		
				TOTAL WEIGHT OF FOOD MATERIAL	PROTEIN	ENERGY
	Cents	Dollars	Cents	Pounds	Pounds	Calories
Codfish steaks	12	0.71	36	0.833	.142	274
Codfish, salt	7	0.44	23	1.429	.229	437
Bluefish	12	1.20	58	0.833	.083	172
Mackerel	10	0.61	10	1.000	.163	998
Salmon, canned	12	0.62	16	0.833	.162	547
Sirloin steak	25	1.52	26	0.400	.066	380
Mutton leg	22	1.46	25	0.454	.069	394
Milk, 7c. qt.	3½	1.06	11	2.857	.094	891
Potatoes, 90c. bush.	1½	0.83	5	6.667	.120	2020
Corn meal	2	0.22	1	5.000	.460	8055
Apples	1½	5.00	7	6.667	.020	1420

Cooking. All the methods of cooking may be applied to fish. The two things to be sure of are to cook the fish thoroughly and not to cook it too long. The time-table at the end of this chapter will be suggestive. Frying and broiling were probably the first methods used, and still retain their popularity. It stands to reason that a thick fish cannot be cooked in this way unless cut in slices about an inch and a half or two inches thick. The flavor of fish is much improved if fried in bacon fat or salt-pork drippings. Some fish is good boiled, but in most cases it is better steamed. In either method it is better to wrap the fish in a piece of cheese-cloth, as it will be remembered that the connective tissue breaks down with only slight application of heat and the flesh falls apart.

Every orthodox housekeeper has a special set of utensils for cooking fish. This is necessary, as it is difficult to wash away so distinct a flavor, even with a strong solution of soda-water. A fish-boiler is usually kept for that purpose only. A broiler is so repeatedly and completely sterilized by the intense heat that it is not necessary to have a separate broiler, but it is better to have the fish-pan under the broiler to catch the drippings. A frying-pan is the worst offender. It is almost hopeless to try to get rid of the odor of hot fat in which fish has been fried.

A fish boned, stuffed, and baked is every housekeeper's pride, especially if she has boned the fish

herself. However, this is not necessary except in small communities, as every city market man will, if required, bone a fish. All except the fish with many small bones, such as shad, is much more palatable if it is boned, no matter how it is cooked. Any reliable cook-book gives directions for this; but if the directions are not clear a dealer will gladly demonstrate the process. Even in shad some of the bones can be removed and make the eating more pleasurable.

Last, the best of all ways is that delicious New England dish, a fish chowder. Clams and cod are the favorite fish for this, though others may be used. A little salt-pork, an onion, a generous amount of diced potatoes, and some milk added in proportion to suit the family taste are essential for this dish. If the chowder is well seasoned and cooked it is a dish to satisfy the most fastidious, especially when two or three of the large biscuits known as hard-tack or pilot-bread are floating on the top. A frequent mistake in preparation of chowder is not to cook the potatoes enough and to have the whole watery.

Left-over Fish. The appetizing dishes to be made from left-over fish are so numerous that only a few can be mentioned. Escalloped fish is made like all scalloped dishes, by alternating a layer of fish with a layer of crumbs in a baking-dish, covering the whole generously with a medium white sauce and baking. In the case of a white-meated fish a pleasing variation of this is

to add a layer or two of tomato. Other variations will suggest themselves to the ingenious housekeeper. Creamed fish is usually good either in one large dish or in individual ramekins. The fish croquette has too often saved the day to be slighted here. Fish pie made with creamed fish in the bottom of a baking-dish, covered with mashed potatoes, has also served its turn at helping to save expense.

It is never economy to save fish that has been cooked in milk. These two foods are easily contaminated and cannot be kept more than one day. This is true of oysters as well as other fish.

Another appetizing way to use left-over fish is in a salad. The white-meated fish makes an especially attractive salad, although the darker fish are much used in this popular dish. Tuna-fish is coming more into popularity for salad, and so delicious do many people find it when combined with celery that they have named it "mock-chicken."

Garnishes. No matter how fish is cooked, it is more appetizing if served with a tart sauce, such as sauce tartare or Hollandaise sauce. It is also more attractive if garnished with something fresh and with color, such as cucumber, lemon, and parsley. Potato balls cut with a French cutter and dipped in parsley-butter add to the attractiveness of the dish, but they are expensive as to time.

A fish which is baked on a plank affords an

excellent opportunity for garnishing. The outside of the plank is usually covered with mashed potatoes piped through a star pastry tube. Lemon baskets filled with parsley or cucumber boxes filled with sauce tartare add to the attractiveness of a planked fish.

Roe. Roe or spawn of fish is a highly prized delicacy, and one usually expensive as compared with the fish itself. The roe of shad is the greatest in demand, probably because the roe of other fish is little known. There is some sale for the roe of mackerel, which a few fish experts prefer to that of shad. There is some little call for cod, herring, and haddock roe. People are not yet familiar with the possibilities of roe as an article of food. Tons of salmon and cod roe are thrown away every year. Efforts have been made to create a market for these, usually salted and canned and sold for a few cents a pound. The favorite way of cooking roe is to braise, bake, or cream it.

At the present time more roe is used in the manufacture of caviar than in any other way. Caviar is roe preserved and highly salted. The choicest caviar comes from Russia, where the roe of the sturgeon and beluga-fish is preferred.

Caviar is used in small quantities as an appetizer, and it has a high nutritive value. It is a rare individual, however, who could eat enough of it to get any amount of nourishment from it. The best way of serving caviar is without any

other accompaniment than some crisp, unsweetened biscuit and a piece of lemon. It is much used as an ingredient of the appetizer known as a canapé, which is served so frequently at the beginning of the elaborate dinner of to-day. When served as a "sandwich" it is usually spread on a thin slice of rye bread, Continental fashion—that is, with no second slice of bread above it—and finely chopped fresh white onion at the side. Sometimes boiled egg chopped fine is added. The high price of caviar makes it prohibitive for the majority of people, even for those who have cultivated a taste for it.

Preserved Fish. There are several ways of preserving fish—salting either wet or dry, preserving in oil, smoking, and canning. There are many advantages in these processes. In the first place, preserving is done at a season when the fish is plentiful and therefore cheap. For salting fish the boats go out equipped to salt the fish on board. When the weather is favorable for fishing the crew is all busy at that work, and when they are obliged to stop fishing all hands clean and salt the fish. In the second place, preserved fish can be safely shipped without loss. In the third place, they can be kept for long periods both in the markets and in the home without loss and without contaminating the other food.

Salmon and sardines are canned in oil. Other less oily fish, of which the most common are lobster, shrimp, herring, and mackerel, are can-

ned without oil. Finnan-haddie, which is spoken of later, is also canned. There is some caution to be observed in the use of canned fish. As soon as the can is opened the fish must be taken out, as otherwise the fish on being exposed to the air develops a strong odor and disagreeable flavor, and there is also grave danger of contamination.

Some fish, like cod and salmon, are dried and salted; others, like herring, are dried, smoked, and salted; and still others, like mackerel and salmon, are preserved in a strong brine. When haddock is dried, smoked, and salted it is called Finnan-haddie. This sometimes comes in a wooden box. When the box is opened the fish does not keep indefinitely, even when in a cool place.

Salted fish, which are inexpensive and appetizing, should be used more than they are. There are several ways of making them savory and palatable. Creamed shredded codfish and fish-balls seem to be the extent of the resourcefulness of many cooks. Finnan-haddie is equally attractive whether baked, broiled, or creamed. Salt mackerel is at its best when it is broiled, although it is very often boiled, and sometimes parboiled and then broiled. One of the most delectable of all New England dishes is salt fish—usually mackerel or salmon, but sometimes other varieties, even on occasion salt shad. This is shredded, mixed with liberal amounts of mashed potatoes, moistened with milk, and heated either in

the frying-pan or the oven. Salt salmon is at its best in this dish, and has a deliciousness of flavor entirely lacking in the same fish when canned.

It is a rare person who does not like some form of fish, and the extension of this liking to cover the many forms available depends on the attractiveness of the preparation and serving. The housekeeper frequently complains of the "eternal round" of beef, mutton, and pork, and fails to take advantage of the wide possibilities for the extension of her present food-supply that are offered by fish. Only in vegetables will she find a greater opportunity for the enrichment of her table.

Seasons. For salt-water fish there are no distinct seasons now. The fishing-vessels sail the length of the coast and fish at all points according to the season of that climate.

The following tables show when fresh-water fish are caught, and the time for cooking fish.

Kind of Fish	Spring Season	Fall Season
Whitefish . . .	May to June	Oct. to Dec.
No. 1 Pickerel . .	April to June	Sep. to Nov.
Herring	May to July	" " Dec.
Blue Pike . . .	May 15th to June 15th	" " Oct.
White Bass . . .	April to July	" " "
Perch	April to July	" " Dec.
Catfish	May to June	" " Oct.
Bullheads . . .	May to June	" " "
Shad and Mullet .	March to June	" " Nov.
German Carp . .	March to	December
Sheepsheads. . .	May to June	Sept. to Oct.

TIME TABLE FOR COOKING FISH

	SMALL FISH	FISH 3 LBS. TO 5 LBS.
Boiling	6–10 minutes	20–45 minutes
Baking	20–30 "	45–60 "
Broiling	5–8 "	10–15 "
Frying	3–5 "	5–10 "
Steaming	10–15 "	30–60 "

XIV

WHY FLAVOR COUNTS

THE use of seasonings, condiments, and flavorings in food has always been considered one expression of the good taste and cultivation of the family. The later discoveries of the scientists studying food problems show that flavors have also a distinct value in nutrition. This is not, of course, because they have themselves any food value, but because the appetizing odor and taste stimulate the flow of the digestive juices, and attractive food is thus more quickly digested than unattractive. An excessive use of spices is harmful, as is an excess in any direction. It also leads to the destruction of real taste in food.

It is particularly important to supervise carefully the children's food so as to cultivate a delicate taste for natural flavors. A jaded taste demands strong and unnatural flavors which overtax the digestive system. The family should be taught to regard and enjoy the flavor of each food, not to pile on ketchup or other sauces, salt, sugar, and pepper, until everything tastes exactly alike.

The preserving of each particular flavor, the enhancing of one flavor by another combined with it, or by the contrast of a condiment, is the work of an artist. The simplest meal made up of food perfectly seasoned is a feast, while an elaborate banquet of food prepared without thought for flavor and taste is almost as bad as a fast.

The particular flavor of each food must be preserved. If the flavor is a delicate one, it must be guarded. If it is a strong flavor, it must be modified. If it is uninteresting, interest must be supplied by condiments, seasonings, or combinations with other flavors.

The delicious fruit flavors are often killed by the addition of sugar. So are the distinctive flavors of such foods as shad, scallops, or fresh peas by a too strongly seasoned sauce. The strong flavors of such foods as onions, turnips, mutton, and herring require modification for the sensitive taste.

Since "variety is the spice of life" in food as well as in other things, it is worth trying for. Many inexperienced housekeepers do not know the value of a well-stocked store-room of condiments and seasonings as a means to this end. The following list is recommended for the necessities. Each housekeeper will be alert to make additions to her store.

Spices. A well-filled set of spice-boxes has the whole as well as the ground spices. Better

flavor is procured from the freshly ground spice than from that which has been powdered for a long time. The set will contain a box each of the following:

Allspice.
Anise.
Caraway.
Celery salt.
Cinnamon.
Cloves: when purchasing the whole clove select dark and oily ones.
Cardamon.
Coriander.
Cumin seed.
Dill.
Fennel.
Ginger.
Indian curry-powder: this is made of coriander, cumin, cardamon, tumeric, cinnamon, mustard, Jamaica ginger, allspice, and bay leaves.
Mace.
Mustard.
Nutmeg: the short and round nutmegs are better than the long and dry ones.
Pepper, black: a very much better flavored pepper is obtained by grinding the peppercorns at home in a tiny mill.
Pepper, white: the white pepper is more pungent than the black pepper.

Herbs. It is well to have on hand the plants named below to be used as seasonings and flavor-

ings, either dried or fresh. Herbs can be dried in the following way: Gather before flowering and on a dry day. Remove each leaf from the stem and place on a sheet of paper in the hot sun to dry. They can also be dried in a moderately hot oven. The essential point is to have the drying done quickly in order to retain the color and flavor. When dry they are easily powdered and stored in bottles until wanted.

Angelica.

Bay leaves: five or ten cents worth of the dried bay leaves will last a long time. The aromatic flavor is a great improvement to many dishes.

Chervil: this is best picked in the middle of the day and just before it flowers.

Chives: the green tops are chopped and sprinkled over salads as flavoring. They are not used dried.

Garlic: a very pungent member of the onion family. Vinegar seasoned with a garlic clove is liked by some as a seasoning for salads.

Gumbo filet powder: this can be made by picking the first tiny leaves of the sassafras-tree, drying them thoroughly, and powdering by rubbing in the hands.

Marjoram.

Mint.

Mushroom-powder: this made at home is better than any that can be bought, if the large variety of mushroom is used. A peck

of sound fresh ones washed and dried will give one-half pint of the powder.

Nasturtium: the fruit of the favorite garden flower, preserved in vinegar, is an excellent substitute for capers. The flowers and leaves, fresh, give piquancy to sandwiches and salads.

Parsley: a small window-box will provide fresh parsley in return for little care. This can also be dried and powdered to use.

Sage.

Shallot or Eschalot: a minor member of the onion family which imparts a very delicious flavor.

Summer savory.

Sweet basil.

Tarragon leaves: a leaf or two in the vinegar-bottle gives the much-desired Tarragon vinegar.

Thyme.

Flavorings. The fresh-fruit flavors are always more delicious than the bottled, but the convenience of the latter demand their place on the shelf.

Bitter almonds.

Orange.

Lemon: it pays to make the home-made lemon and orange paste for flavoring because of the better flavor procured. Grate the lemon or orange peel, mix with powdered sugar, add a squeeze of its own juice to make a paste. Keep in a covered pot.

Vanilla: the flavor of the dried vanilla-bean grated or dissolved in alcohol is very different from the flavor of the vanilla extract usually bought.

Caramel: this may be made and kept for use. Mix four tablespoonfuls of sugar and two tablespoonfuls of water in an agate saucepan; boil ten minutes. Continue the cooking until it is golden-brown like thick molasses. To this add one-half cup of hot water, stir until dissolved, boil to a syrup, and pour into a bottle. This will keep for years and is a most delicious flavoring for cakes, custards, and sauces.

Miscellaneous. A bottle each of

Olives.
Gherkins.
Soy.
Anchovies.
Walnut ketchup.
White wine
Claret
Cooking sherry } if desired.
Brandy

The time spent in preparing these things is well paid for in a number of ways. With such a store at hand, left-over food can be charmed into appetizing dishes, the cheaper and less attractive staple foods can be given distinction and flavor, and the cook will acquire a reputation for skill and judgment.

XV

WHAT TO EAT TOGETHER AND HOW TO SERVE IT

THERE is no place in the housekeeping system where help is needed more than in the planning of the meals. There is no part of the work that needs more skill, more imagination, or more originality than the combining of foods.

Moreover, there is nothing that the homemaker does that receives such censure. Every one feels privileged to find fault with the meals, and to comment if an unpopular dish is served. On the other hand, if the meal is pleasing to the eye, satisfying in content, and attractive in service, the entire family is happy and good natured, but only too often they fail to give the credit where it belongs. Since the way the food is served is so important, a little consideration of that must precede the discussion of the food itself.

The time spent at the table should be a time of relaxation and repose. Anything in the arrangement of the dining-room or the table which is not orderly disturbs the pleasure.

For this reason if the housekeeper is cook and

maid she must have everything so arranged that she will not be getting up from the table oftener than necessary. It is very disconcerting to have some one leaving the table every few minutes to fetch a dish or piece of silver that has been forgotten or to remove and place the courses. When there are guests it is much better to arrange a meal that can be served easily than to plan one that requires all the attention of the hostess to prepare and serve. In the latter case the preparation leaves her in too weary a condition to enjoy the guests.

The table should be arranged carefully and not overcrowded. Doilies and runners, which are more economical to launder than tablecloths, make the table very attractive. Inexpensive china is obtainable in dainty patterns. Chops served on roses or Watteau shepherdesses rather take away than stimulate the appetite.

The serviette, or "Lazy Susan," is helpful in simplifying the serving. In olden days these were made of mahogany or some other wood, but the modern serviette is a circle of plate-glass that turns easily on its pivot. It is so well balanced that even a heavy dish may be placed on it with safety. If the bread, butter, cheese, and conserves are placed upon the serviette, many trips around the table are saved, as each member of the family can reach out and turn it at will. It may even be used, where there is no maid, to carry the plates to the guest and bring back the used ones

to the hostess. A wheeled serving-tray standing at her right gives a place to set all the used dishes and to keep other dishes for which there is not room on the table.

As to the kind of food required, it has already been said in Chapter II. that this depends upon the age and occupation of the person. It also depends on the climate and season. Food suitable for January might be almost revolting in July. For example, on a cold, crisp day the diet may well consist of generous amounts of fat and starches—both energy-producing foods—the very sight of which would take away the appetite on a hot day. A menu like the following illustrates this point:

Black Bean Soup
Roast of Pork Apple Sauce
Riced Potatoes Creamed Turnips
Cheese Salad
Pie

Fancy such a combination on a sultry night when nothing appeals to the appetite but

Iced Bouillon
Broiled Chops Riced Potatoes
Fresh Peas with Melted Butter
Lettuce Salad
Fruit Sherbet

The first menu, moreover, is too hearty at any season. If a lighter soup, salad, and pastry were

substituted the dinner would be better balanced and much more appetizing.

Salads should be conspicuous on the summer menus. Dinner salads are better served with French dressing, reserving the cooked dressings and Mayonnaise dressings for the salads that occur as a main course. Jellied soups served ice-cold, and cold, light desserts add greatly to the dinner served on a hot night. Refreshing, cooling drinks are a valuable aid in hot weather.

Iced coffee with whipped cream is not served as often as iced tea, but it is very popular with coffee lovers. Lemonade, iced grape-juice, old-fashioned raspberry and currant shrub are greatly appreciated in hot weather, but are more acceptable between meals. For this purpose, too, ginger ale and Apollinaris water added to any fruit juice make an attractive variety.

It is a fact that when food is attractive to the eye the digestive juices flow more freely. For this reason the color should be taken into account. A meal of one color does not appeal. For example:

Cream of Onion Soup
Baked Hallibut Mashed Potatoes
Creamed Cauliflower Fresh Celery
Cabbage Salad
Rice Pudding

All these dishes are good and wholesome, and in proper combinations attractive, but as they are

combined here there is nothing to relieve the monotony of color. The menu is almost entirely white.

Onions with a fish dinner introduce an excellent variety of flavor, but cream-of-onion soup with creamed cauliflower not only repeats color, but repeats cream sauces—one of them thin sauce and the other thick sauce. Moreover, both are combined with vegetables of strong flavor. Mashed potatoes increase the whiteness of the menu. Potato balls or whole potatoes with parsley butter would relieve the monotony somewhat.

A salad with color can easily be substituted for the cabbage salad, which, by the way, supplies another strong-flavored vegetable. It takes very little imagination to substitute a dessert that will add flavor and color and interest to the entire meal. To repeat a flavor takes away interest. The combination of cream-of-pea soup and peas with the main course or in the salad shows lack of thought, as does the use of rice for a vegetable and rice in the dessert.

Two foods cooked alike are unattractive if served in the same meal. Crullers or doughnuts for a luncheon dessert will not be popular if croquettes have been served in the same luncheon, since both are cooked in deep fat. Neither will waffles—great favorites though they are—be received with much enthusiasm if they come at the end of a meal in which fritters have been served,

since they are both fried flour mixtures. Since economy must not be sacrificed to attractiveness, the thoughtful manager will serve a favorite dessert or salad, and sometimes both, with a left-over meat. Or if most of the dinner or luncheon must be of simple combinations, especial attention should be given to the arrangement of the table and the manner of serving, but most of all to the seasoning. A little tomato or red or green pepper often changes unappetizing into appetizing dishes.

Foods containing the food principles in the same proportion should not be served together. A well-balanced meal is that which has neither too much protein, nor too much starch and sugar, nor too much fat. The right combination of food from this point of view is the most difficult of the food problems the housekeeper has to face. To meet it she must acquire as much knowledge as possible of food values.

The following menu shows an abundance of starch and a lack of flavor:

Vegetable Soup
Lamb Mashed Potatoes
Rice Croquettes Lima Beans
Salpicon of Fruit Creamed Tapioca
Coffee

Potatoes, rice, Lima beans, and tapioca all have a great amount of starch, and three of them should never occur in the same meal.

The foods with a great amount of protein are

meat, fish, eggs, milk, and cheese. A few vegetables are rich in protein as well as starch. These are the legumes—peas, beans, and lentils. When a menu is arranged with a small serving of meat or no meat at all, the amount of protein can be increased by the addition of one of these vegetables high in protein. Or if the starch content of the meal is low these vegetables are a valuable source of starch.

On the other hand, if the meal is rich in starch it would be better to serve some vegetables that have a high per cent. of water. If the main dish is macaroni and cheese with a cream sauce, a dish rich in protein, tomatoes, beets, or spinach would add character to the combination, where peas or string-beans would make it too heavy.

Vegetables high in water, and therefore refreshing, are lettuce, tomato, cucumbers, radish, celery, onions, carrots, and the like. Vegetables with a strong flavor, and therefore better not served together, are onions, cabbage, cauliflower, and turnips.

Fruits all have a great amount of water, and most of them a distinct flavor—some strongly acid. Fruits either fresh or cooked should be used generously in all menus to stimulate appetite as well as to furnish mineral matter.

Although relishes, such as pickles, olives, and highly seasoned sauces, have not much actual nutritive value, they have a distinct place in the diet. By adding variety of flavor they stimulate diges-

tion and oftentimes excite a desire for more food and thus help a lagging appetite.

Preserves and jellies have a place on the menu also, if they are not used to excess. As energy-producers they rank very high; but, since no large amount should be eaten at a time, their chief value consists in the variety of flavor which they introduce.

Clear soup or bouillon at the beginning of a dinner is not taken to add nutritive value so much as to stimulate the digestive juices to action before the heartier foods are eaten. A soup which is made with milk or cream is more acceptable at the beginning of a light meal than when hearty food is to follow.

The meat course should be followed by a savory salad, which does not add appreciably to the nutritive value, but which has a dietetic value not to be disregarded. The crispness and freshness of a salad are decidedly stimulating to the appetite To serve a rich salad with an elaborate dinner or luncheon is not only a waste of money but a waste of human energy. A hearty salad belongs in a light meal, as does a hearty dessert. To serve rich pastry and puddings after a substantial dinner is "gilding gold." When the keenness of the appetite is satisfied by the meat course, what follows should be characterized by daintiness and attractiveness, so as to gratify the esthetic rather than the physical appetite.

In conclusion, what we eat together may be

briefly stated as follows: A meal should not be too dry nor too wet. There should be one food rich in protein. There should be enough fat skilfully blended. There should be a selection from the cellulose group for bulk. There should be enough starch, but never too much. Whenever possible there should be a green vegetable. There should be a savory to add flavor. There should be one distinctly sweet food, preferably at the end of the meal.

The housekeeper who plans with all these requirements in mind soon becomes wise in food values almost without knowing it. But attractive, nourishing meals never come without planning.

XVI

HOW TO KEEP FOOD

AS has already been said, food may come into the house in good condition, and still may be spoiled or lessened in value by carelessness or ignorance in caring for it. One of the greatest extravagances in American homes is the waste of food supplies.

The apartment dweller whose store-room space is limited to a built-in set of shelves and a small refrigerator can buy her supplies only in small quantities, but in a real house the care of the store-room, cellar, and cupboards is a troublesome problem.

A store-room for food supplies should not be tucked away in a dark corner. If the food is to be kept free from mold and decay the store-room should be cool, dry, light, and airy. Does anything give a more refreshing appearance of cleanliness than white walls and shelves in a room where food is kept? If white-enamel paint is beyond the means of the household, surely whitewash is cheap enough, and has the advantage that it can be renewed even more often than paint.

If any housekeeper has ever had a cellar or store-room with a brick floor she will raise her voice in protest against such. Too often has she dragged her weary body up from a vain effort to clean between the cracks. She, more than any one else, knows how to appreciate a store-room with smooth, easily cleaned walls and floors. If the floor is of brick it should be cemented. All cement floors should be painted with cement paint. One can never "sweep clean" an unpainted cement floor, as the surface constantly comes away in a fine dust.

If any place in the house should be free from dirt-collecting surfaces it is the place where food is kept. A set of shelves suspended from the ceiling and hung free from the wall in the cellar or in any store-room is an excellent device, because it permits a circulation of air around the food. This factor should always be taken into consideration, since molds and bacteria flourish best in stagnant air. Whenever possible there should be direct ventilation from the outer air.

A cupboard for dishes is most attractive when it presents a white, shining surface. The best finish is white-enamel paint, and this can be put on by any housekeeper. Unpainted shelves need two coats of ordinary paint (with plenty of time for each to dry), and then one coat of enamel. This last should dry at least forty-eight hours. A fresh coat of enamel once a year keeps this surface in condition. It is quite unnecessary to

have even a small crack in wall or shelf. A little putty or plaster of Paris covered with paint will fill up dirt-collecting cracks.

White-enamel cloth is so easily kept clean that some housewives prefer it for a shelf-covering to paint. It is, however, porous, and harbors bacteria. Also either enamel cloth or paper is a trap for the unwary, since small particles of food and small insects collect under it. The enamel paint is cheapest in the end as well as most cleanly. Some housekeepers object to white paint because it shows the dirt. This is certainly an amusing objection when the first essential is to be able to see all the dirt there is.

A cupboard or a pantry with a window in it is a joy. It is hard to ventilate simply by means of the door. It is much easier to find things in a compact cupboard than in a large, rambling one, although it is sometimes harder to arrange it conveniently at first, and often it necessitates choosing utensils that exactly fit the space.

If the shelves of the cupboard are plainly labeled there will be less difficulty in keeping them in order. If there is a maid in the house this should be done for her convenience, and if a woman is her own cook it is still an orderly plan. It is especially helpful to the occasional guest who wishes to be useful to her hostess.

An emergency shelf is a great convenience in a pantry. If the housekeeper knows that certain supplies are always on this shelf, she will be able

to give unexpected guests a hearty welcome. What this shelf should contain will depend upon the distance from the source of supplies, the resourcefulness of the kitchen garden, and the foods which the cook can most skilfully prepare at a moment's notice. To make this shelf really useful the supplies must be replaced as soon as possible after they have been used.

The convenience and attractiveness of the cupboard or shelf are much increased by uniform supply-jars. The best receptacle is a wide-mouthed jar with a metal top. These glass jars have several advantages. They always look well on the shelf, they are easily cleaned, a glance shows when the supply is getting low, and the wide mouth makes it easy to take the contents from the jar without spilling on the shelf or table.

The earthenware jars that are now being made with decorations in attractive blues and other colors appeal to some housekeepers who like to fit up the kitchen and pantry in a definite color. They are somewhat heavier to handle than the glass jars, and have the disadvantage of not telling so plainly when the supply is low. They are also more costly and break more easily.

Another container which recommends itself because of economy is the tin can. It is light in weight and more durable than the others, and can be tightly closed, but it has the disadvantage that in order to know the condition of the larder

the cans must be taken from the shelf and the cover removed.

A systematic housekeeper can easily get a uniform shelf of supply-holders by saving the receptacles in which is packed some food of which her family happens to be very fond. The glass jars that prunes and other dried fruits are sold in are excellent for cereals.

For spices the small jars in which stick candy is sold (five and ten cents a jar) are very good. More than one kitchen has a complete set of such jars with the painted labels. Aluminum or some other metal covers are preferable to glass, as the latter are easily broken. Any cover, however, must be such as to be easily cleaned. Larger jars are more expensive, but in the end they are an economy, as their use prevents waste. The careful housekeeper who cannot buy a whole set at once can get one each month until she has all she needs.

Bread and cake boxes of enameled tin look better, wear better, and are much more sanitary than those of wood. The white-enameled ones are the most attractive. A roll-top bread-box is in any case much more convenient than a hinged top, which must have a space above it the width of the cover. Where space is limited it is particularly important to note such differences. For supplies like flour and sugar the tin cans with hinged covers are excellent. When wood or tin receptacles are chosen, care must be exercised

NARROW SHELVES AS AN AID IN TAKING ACCOUNT OF STOCK

in selection. Cracks and joints are difficult to keep clean and make good hiding-places for insects.

Whatever the material, it is essential to have each one plainly labeled. The best method is to paint the name on with a fine brush. Black shows best on glass jars. It is not hard to do this, and a little patience soon enables one to do it neatly. When the paint is thoroughly dry a coat of shellac should be put on over it to prevent wear. Uniform paper labels, shellacked, are next best.

Cereals, spices, condiments, sugar, and the like should never be left in the paper bags or boxes in which they come from the grocer. The paper bag is always a snare, as it cannot be kept tightly closed. Even tin boxes should be discarded when they are covered with paper. Mustard, for example, should be emptied at once from the tin box with its paper label into the glass jar. If it is left in the tin box the paper label gets dirty and offers a harbor for dust and possible insects, the lettering gets obscured, and the housewife can tell when her supply is low only by taking the box down, removing the cover, and looking into the box. The glass jar is a constant reminder of the amount on hand, and it keeps out foreign matter.

The dairy products are the most troublesome to care for. The care of milk has been described in Chapter X. How to keep cheese is a problem.

If it is shut up in a box or jar it molds. If left out in the air it is covered with dust. The best plan is to keep the cheese in a wide-mouthed glass jar with a cover of paraffin paper fastened with a rubber band.

Whenever possible a shelf should have only one row of receptacles. The back row is a nuisance in every way. Usually shelfs are built much too far apart and too wide. In that case a second shelf against the wall, half the width of the first, can be added between. Each housekeeper must plan her own space carefully.

Refrigerators. There is nothing in the entire household equipment more worth while than a well-constructed refrigerator. There are many good ones in the market and many poor ones. A refrigerator complex in construction is hard to clean.

Cold air is heavy and falls, therefore the ice compartment should be at the top. The food compartments are lined with various materials. Those with white enamel or porcelain or glass are the best, although there is no reason why zinc or galvanized tin should not be kept clean.

Soda is the best cleanser to use about the refrigerator, as it is odorless. A disinfectant with an odor, while an excellent thing in many places, should never be used to clean food receptacles. Dairy products are extremely sensitive to odors.

Rules for Care of Refrigerators

1. There should be a set of white-enamel dishes and plates to use in the refrigerator. Cut glass and fine china should never be put there, as the danger of chipping or breaking is great.

The use of cracked or chipped dishes for food is greatly to be deplored. The rough surface left by the crack or chip is an excellent place for bacterial growth.

2. Uncooked meat should be kept in a covered enamel dish. It should *never* be wrapped in paper.

3. No paper should be used about food in the refrigerator.

4. Milk-bottles should always be washed before being put in the refrigerator.

5. Eggs with barn-yard soil should not be put into the refrigerator. The reason for not washing clean, fresh eggs has been given in Chapter X. Eggs should be kept in a rack or a dish with one layer, so that they may be used in the order in which they were bought.

6. The contents of the refrigerator should be examined every day, and no stale food left there.

7. If anything is spilled it should be cleaned up at once.

8. The shelves and floor of the refrigerator should be washed every day with a soda solution and the refrigerator cleaned thoroughly at least once a week.

One part of the refrigerator that needs especial

care is the pipe that carries the drippings from the ice-compartment away from the refrigerator. This is a removable pipe and needs to be cleaned weekly with a long-handled bottle-brush and a strong soda solution (one tablespoonful of soda to one quart of water) and rinsed thoroughly with clean, hot water.

Garbage. The garbage-can is a problem in every household. It would be a relief if some one would invent a device by which garbage could be consumed cheaply on the spot without smoke or odor. There is an excellent garbage-incinerator run by gas, but it is too expensive for the ordinary family.

In most cities the disposal of the garbage is a municipal concern, but it leaves much to be desired. The can is emptied and left at the back of the yard—usually uncovered—with more or less garbage still clinging to the sides and bottom. This means that the housekeeper has a very disagreeable task before her. The remaining garbage must be taken care of and the can thoroughly washed. Nothing freshens a garbage-can so satisfactorily as a boiling soda solution.

The garbage-can should always be securely covered; otherwise it attracts flies and thus becomes a menace to the household and the neighborhood. If the garbage-man and the housekeeper are not on the scene at the same time, the flies gather in the neighborhood and the housekeeper's sanitary difficulties are multiplied.

The care of the garbage is somewhat less dis-

agreeable if the Department of Health does not object to the can being lined with clean paper (newspaper is excellent) or one of the heavy paper-bags made for the purpose. The housekeeper is most fortunate who lives in a community that maintains a company that removes can and garbage and leaves a clean can in its place. She has to pay for removal, but is spared the disagreeable task of cleaning the can.

The disposal of garbage in the country is a household rather than a municipal problem. Each household must solve its own sanitary difficulties. Such garbage as cannot be fed to the stock must be burned or buried. Most housekeepers think that it ruins a kitchen range to burn garbage in it. This opinion is based upon the theory that the great amount of moisture in such refuse warps the stove.

To save frequent trips out of doors it is a good plan to have a covered white-enamel jar for garbage on the sink-drain. For a small family this needs to be emptied only once a day. If it is washed every day in hot water it will keep sweet and clean.

From the moment food material is chosen in the market to the time it is finally disposed of as garbage, every precaution must be taken. Until it is no longer usable it must be guarded from contamination, and after it is useless as food it must be guarded as a possible source of contamination to other foods and to people.

XVII

HOW TO USE A COOK-BOOK

THE value of a book depends as much upon the way it is used as upon the information it contains. To get all the help even the best cook-book can give, one must know how to carry out the directions given.

For instance, what is meant by a cupful or spoonful? Modern cook-books all use level measurements. This means, for dry materials, a spoonful or cupful over which the edge of a knife is passed; for wet materials, as much as the cup or spoon will hold. Materials measured in this way are fairly definite quantities—not as definite, to be sure, as weighing would be, nor as definite as such measuring will be when measuring-cups and spoons are made of standard sizes.

The measuring-cup is supposed to hold one-half pint, and sixteen tablespoonfuls should fill the cup. The manufacturers of kitchen supplies are at last realizing that women are serious in the demand for uniform-sized cups and spoons to use for measuring.

If exactly the same materials are put together under exactly the same conditions the result will be the same—as it is in all other industries. Why

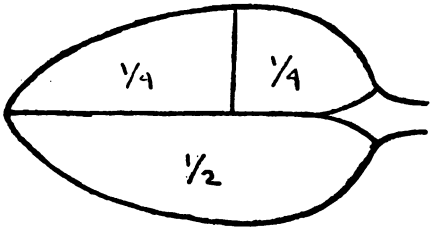
should we assume that the preparation of food is an exception to the law of cause and effect? When all measuring-cups hold one-half pint, and tablespoons and teaspoons are of standard size, the poor cake will always mean careless measuring. The chances for failure are greatly lessened if the following rules for measuring are faithfully observed:

Sift flour directly into the measuring-cup until the cup is overflowed, pass a knife over the top, smoothing the flour without packing. Measure a tablespoonful and a teaspoonful in the same manner. A half-spoonful is the spoonful halved lengthwise (see diagram). Because of the shape of the spoon this makes a more nearly perfect division. Where the older cook-books call for one spoonful it is usually safe to use two level spoonfuls, and a cup and a half level measuring for a heaped cup.

Flour is used as an illustration for dry ingredients, because care must be taken not to pack it. Sugar, corn-meal, and other dry ingredients are not easy to pack in the cup. The old method of measuring was to take as much as the cup or spoon would hold. This differed for different people, some being more skilful in filling the cup or spoon. It is true that experienced cooks acquired a judgment in measuring and usually took about the same quantity each time, but this was an individual matter.

The change toward accurate measuring of ingredients and the observation of the same con-

ditions in mixing and baking guarantee the same results. One woman is making a large income from the sale of cake which never varies in excellence. She weighs all materials and uses an oven thermometer, thus leaving no room for chance.



SPOON SHOWING METHOD OF DIVISION

When the prospective cook has learned to measure she must next understand the abbreviations commonly used in the up-to-date cook-book. These vary slightly, but usually follow this table:

tb.	or T.	stands for	tablespoonful
tsp.	or t.	" "	teaspoonful
	c.	" "	cup
	qt.	" "	quart
	pt.	" "	pint
	lb.	" "	pound
	oz.	" "	ounce
	f. g.	" "	few grains
	r.	" "	rounded
	hp.	" "	heaping
	sc.	" "	scant
	min.	" "	minute
	hr.	" "	hour.

The intelligent cook will know certain proportions of ingredients that may be successfully combined. She will know reasons why certain combinations will or will not bring about a desired effect. She will understand the effect of heat upon the materials to be used. With this intelligence at her finger-ends she is ready to read her cook-book and decide which recipes will probably be good ones to try.

After deciding this she will read the whole rule over very carefully and consider the ingredients. Of course, changes can be made in certain things, and here she will show her judgment. Spices and flavorings can be substituted one for another, or left out altogether, or added to the recipe that lacks them. Sour milk may be used in place of sweet milk if soda is substituted for baking-powder. Water and butter may replace milk. A variation in the quantity of shortening may be made within certain limits. One may use fewer eggs and more milk or more eggs and less milk. These and numerous other changes can be made and will add to the interest of cooking. Only the one who has achieved knows the fun of doing the old thing in a different way, so that it seems a new thing to those who eat. The savings resulting from using two eggs in place of four, when the price is high, or a butter substitute for butter, or water for milk, accumulate with encouraging results.

The housekeeper, having decided just what in-

gredients she must and which she chooses to use, will collect all of them and all needed utensils before beginning the operation. The fire, if one is to be used, next receives attention. How many people know that it is better to leave the oven door of a gas or oil stove open when the light is first lighted? This is in order to dry out the oven, which takes about five minutes.

With ingredients and utensils at hand, and oven ready, the successful modern cook accurately and intelligently follows the directions laid down in the recipe, varying only in the non-essentials. If the cooking does not need constant watching, the starting and finishing time are written on a slate. Or an alarm-clock is set to attract attention at the moment when the pie should be done. When the cooking is completed the housekeeper keeps it hot or sets it to cool, as may be needed, and does anything necessary to make it as appetizing as possible when served.

All this may sound complicated or confusing, but it resolves itself into the general directions: "Follow a reliable cook-book with intelligent accuracy, and have an active interest in procuring a perfect product."

Recipes that travel by word of mouth may be very irritating. Sometimes the most important ingredient is forgotten—as sugar in a cake. One with experience will know that there must be sugar in a cake, and put it in. After trying a few such traditional recipes one quite understands

how our grandmothers acquired the reputation for certain dishes that "no one else could make."

Our modern cook-book calls for judgment to follow its rules successfully, as did the older cook-books, but the modern cook-book calls for a different kind of judgment. One need not have measured butter for cake or flour for gravy to make either of these things, but one must know how correct measurements are made. The trained laboratory worker with the fine eye and exact mind proves a capable cook, unless he or she is without a sense for flavoring.

As the housekeepers grow more exact and accurate the cook-books will improve to meet their demands, until cooking is a much more exact operation than is now possible.

A convenient method of keeping recipes from magazines or those given by friends is to copy or paste them on library cards to file in a card-catalogue. The housekeeper who organizes her work well will add to her card-catalogue menus which have proved successful. She will have a list of easily prepared dishes, the quantity they will serve, and an approximate cost. When unexpected dinner or luncheon guests appear, or when the well-planned meal fails because the grocer or butcher fails, or for some other reason, such a list will be found the very best friend in need. She will also check in her cook-book all recipes found satisfactory, will write opposite each how much it costs and (if this fact is not given in

the recipe) how many it will serve. She will use recipes, but will not become a slave to them.

METHODS OF COOKING

Boiling. Cooking in water heated to 212° Fahrenheit. That is, water from which the steam is escaping so fast that it is in a violent state of ebullition.

Simmering. Cooking in water at 185° Fahrenheit. That is, when bubbles of steam break at the bottom of the liquid.

Baking. Cooking in an oven.

Roasting. Properly, cooking before a fire. Now used to mean the same as baking.

Broiling. Cooking over a very hot fire.

Braising. Cooking in a closely covered pot or pan, with a little water or stock. It is really cooking in steam.

Fricasséeing. Meat cooked in this way is first browned, then simmered.

Sautéing. Cooking in a little fat, often wrongly called frying.

Frying. Cooking in deep fat.

XVIII

SOME USEFUL UTENSILS

IN selecting a dish or a utensil, the first consideration is its fitness for its use, and the second the ease with which it can be kept clean. Deep ridges on the inside of a pitcher or vegetable-dish, for example, make it almost impossible to remove the dirt that collects there. When selecting china, either for the table or for storing food, the housekeeper must not be carried away by an attractive design until she is sure that the inside can be kept immaculate.

Of buying kitchen utensils there is no end. Each housekeeper has her favorite ware. One prefers white or blue enamel because it helps to carry out a color scheme. Another likes gray agate because it does not chip, and another is more successful with aluminum ware. If a careful housekeeper is using the utensil herself she finds that the good grade of all wares gives good service; but if an ignorant person has charge of the kitchen all ware is equally unsatisfactory.

The comparative cost of tin, agate, enamel, and aluminum each housekeeper can work out

for herself by keeping careful records of cost and wear. Prices and uses vary too much to give a definite statement here. One thing, however, is certain—it never under any circumstances pays to buy a cheap grade of any ware.

There are some labor-saving utensils that are worth the attention of every housekeeper. They may or may not fit into her needs, but if she is on the alert for improvements she will certainly find some devices that she can use.

Scales. Every household should have an accurate scales for weighing supplies. It is not necessary to check up all supplies when they are delivered, but whenever the amount seems questionable. It is also worth while to weigh the edible contents of packages (biscuits, oatmeal, macaroni), and compare the amount with the amount of bulk material bought with the same money. It is worth while again to know how much meat or poultry is edible, how much is waste, and how much is lost by evaporation in cooking, so that the housekeeper can know the cost per pound eaten.

Double Boiler. A double boiler is an indispensable utensil in the kitchen equipment. The water in the lower part of the dish boils and communicates the heat to the upper pan, keeping the food there at a high temperature, but never letting it reach the boiling-point unless the bottom boils dry. The double boiler has many advantages, not the least being its independence of

attention. So long as there is water in the under part the food in the upper part will not burn or scorch. The cook may sweep, dust, cook dinner, tend the baby, or settle herself to a book while the food is cooking in the double boiler.

The economical housewife will choose this utensil with care, buying one that can, when necessary, be converted into two saucepans, or the new device upon the market—a tea-kettle with an upper pan that fits into the top. If there is not a double boiler among the kitchen utensils one can easily be improvised by setting a small saucepan into a larger one.

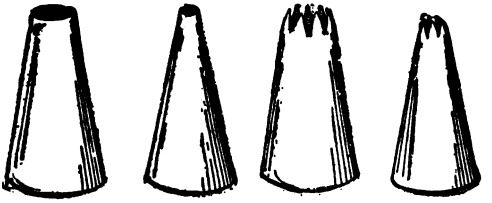
Fireless-cooker. A fireless-cooker is worth having if only to cook the porridge. Not only does it require little gas or electricity to generate the needed heat, but the long, slow cooking really cooks the cereal more thoroughly. But this is not its only use. For the long, slow cooking needed for the tougher cuts of meat the fireless cooker is ideal, and it is also excellent for many vegetables and much baking.

There are many types of cookers on the market. In buying it is wise to select one without seams in the lining; if there are seams the joints collect the steam and the lining corrodes. The cooker is then most undesirable, being unsanitary. Even if the initial expense is greater, it is economy to buy a cooker with the lining cast in one piece. Some of the newer cookers are equipped with a

SCALES

MELON MOLD

CASSEROLE



PASTRY-TUBE ENDS

steam valve which prevents the moisture from collecting in the cooker.

It is not necessary to buy a manufactured cooker. One can be made at home with a box, some hay or mineral wool, and a good, stout fabric—ticking or something of that sort—for a lining. Such a cooking-box can be used only for certain foods, and does not serve all the purposes of a patented cooker. For example, it would be most undesirable to cook some vegetables—turnips, onions, and the like—but perfectly safe to cook cereals, providing the box was well aired after using.

It has been demonstrated by careful experiments that the average family can save enough gas in three months by using a fireless-cooker to pay for almost any good one on the market. Recently there has come on the market a "gas fireless stove." This is a gas-range with insulated ovens, and it combines the uses of the ordinary gas-range and the fireless-cooker. The cost is about the combined cost of a good range and a good cooker. It is a great advantage in saving room and in doing away with the stones that have to be heated for any baking in the fireless-cooker.

Casserole. With the price of meat soaring above the heads of the majority of people, a casserole is an almost necessary dish. The casserole is an earthenware dish for baking, and is not an expensive utensil. Casseroles are made in every

shape and size from the individual ramekin to one sufficient for a large family. Each size can be had with or without a holder, and the expense varies accordingly. Many people like best the porous casseroles with handle of the same that are used by the Italians and the French.

The casserole may be used on top of the stove or in the oven, the latter being the best method. The earthenware dish holds the heat and keeps the contents at the gentle steaming temperature so desirable for meat, poultry, and some vegetables and fruits. Cuts of tougher meat when steamed in a casserole in their own juices, to which vegetables have been added, are even more delicious than more expensive cuts.

A casserole dish lasts quite as long as any other cooking utensil if it is given proper care. Before being used, the dish should be soaked in cold water for several hours and then heated slowly. The dish must not be exposed to sudden changes of temperature. If it is taken from a hot oven to a cold sink, or plunged into cold water, the sudden contraction will probably crack the dish. When the dish is used on the gas-stove, an asbestos mat should be put between it and the burner.

Bread-mixers. In this day of efficiency the housekeeper whose work is never done is as anxious as any one to know the short-cuts. The bread-mixer is one of these time-savers. The ingredients for the bread are all put into the mixer at once with sufficient flour for the dough, the

mixer adjusted, and turning the handle does the rest. There is no setting of sponge, no kneading by hand, and the best of it is that the ordinary man likes to turn the machine!

There are mixers for two loaves of bread and for eight loaves or more, so that the small family as well as the large one can benefit by this labor-saving device. In selecting a bread-mixer the buyer should consider the ease or difficulty of cleaning it and also should choose one that has the motion easiest for her.

Cake-mixers. A cake-mixer is made on the same principle as the bread-mixer. All the ingredients are put into the mixer and beaten up together. Five or ten minutes is sufficient time to allow for putting a cake together. This saves a great deal of the housekeeper's time and produces good cake.

Cake-coolers. A cake-cooler is not indispensable, but it is convenient. This is a sheet of woven wire which stands about an inch from the table. It allows a circulation of air around the cake or bread, the loaf cools more uniformly, and there is no condensation of steam on the bottom of the loaf.

Cream-whip. There are several utensils for whipping cream. No one of these should be bought without careful examination, as some of them are "very, very good," and some of them are "horrid."

Waffle-irons. Some waffle-irons are made with

a high standard, so that it is unnecessary to tip the iron to turn it above the gas-jet. Another pattern is a low standard to fit over the hole on a coal or wood stove. To use a low iron on a gas-stove means to clean up a good deal of grease that has run out of the iron.

Potato-baker. A cook who has burned her fingers taking potatoes out of the oven will be glad to use a potato-baker. This is a device of tin or wire with sharp prongs upon which to put the potatoes. The baker is made to hold six or eight potatoes, and these bake more evenly than when laid on the oven floor.

Fancy Molds. To put an artistic touch to the menu it is well to have a few fancy molds for puddings and gelatine desserts and ice-cream. The melon mold is the most common, perhaps, but there are many other patterns.

Pastry-tube. A star pastry-tube is used to garnish a fish-plank or steak-plank or platter. Potatoes piped around the meat or fish give an idea of very skilful technique when really all it requires is practice. For state occasions the pastry-tubes may be used to decorate a cake or put méringue on a pie.

In choosing any labor-saving device the housekeeper must calculate carefully what she will save in time and energy, and also what the advantages or disadvantages of each device are from the sanitary point of view.

XIX

A FEW WARNINGS

So many traditions regarding food and cookery have been handed down from one generation to another that each housekeeper ought to investigate and find out which are founded on scientific fact and which are fallacies. The age for following blindly is past in all sciences, and surely the household should not be the last center to emerge from it. Each individual housekeeper should observe and experiment for herself and use the knowledge that science has made available.

There is a great deal of agitation now, some of it to much purpose, but some of it to no purpose except to swell the pocket-book of the agitator. Often statements printed without much authority are repeated so frequently that the average person does not think of questioning them. Food fallacies are like superstitions; a very intelligent person once declared: "I am not a bit superstitious, but I do hate to break a mirror." So people may be intelligent on most subjects in cookery, but cling to one false idea.

Appetite as a Guide. A good example of such a statement is that a person needs what he craves. If a young girl craves pickles she is sometimes allowed to have all she wants on the ground that her system must need acid. Nothing could be more absurd, for if she needed acid in such amounts, there would be some physical disturbance to indicate it. Young children who crave sweets are sometimes allowed to eat generously of candy. It is true that the child needs sugar, but this should be given as a part of a mixed diet, and not in the concentrated form of confections.

It is not strange that whenever a diet is insufficient the individual craves sweets, since sugar provides an easily available form of energy. But to furnish any considerable amount of this energy in the form of candy is dangerous, because it provides the energy without providing the essential mineral matter. Unfortunately, people go to extremes and speak as if candy and any form of sweets were in themselves harmful. The harm lies in their excessive use.

Some physicians think that when a child develops a craving for chalk and slate it is an indication that he needs more mineral matter in his diet. Whether that is true or not, it is a case for expert advice, and not a question for a child's abnormal appetite to decide. Neither does it indicate that alcohol is needed by the body when a man or woman craves alcoholic drinks.

There is a reverse side to this. Not only is it

true that the craving does not prove the need, but it is also true that the lack of desire does not prove that the need is not there. In other words, if some member of the family says he does not want some particular type of food, he often needs it. Young people especially have strong likes and dislikes and decide in favor of or against a dish before tasting it. If they can be persuaded to taste the dish it may become a great favorite. Habits in eating can be changed as much as other habits. Any one who helps a child to cultivate a taste for a variety of foods is helping him to build a good body and also preparing him to gain lasting pleasure and to avoid embarrassment.

Food Value. Another mistake is to suppose that a food is nourishing exactly in proportion to the food value of the raw material. The cooking and the serving are also very important in rendering food nourishing. It is well for the housekeeper to know that oftentimes the responsibility rests with her. The nutritive value of a food may be much impaired by poor preparation and cooking. Food may come to the house in good condition, but through neglect or ignorance may become absolutely useless. Or it may be cooked in such a way as to make it difficult of digestion.

For example, eggs cooked at boiling temperature become tough and more difficult for the digestive juices to penetrate. Meat is sometimes cooked so long that it is hard to digest; or, on the

other hand, a tough piece of meat which slow cooking at a low temperature would make palatable and digestible is cooked at a high temperature for a short time without the same good effects. We have already dealt with the importance of flavor. Attractive serving also has a great deal to do with the value of the food. Although her language is inaccurate, there was a good deal of fundamental truth in the remark of the woman who said that a certain food was not nourishing "because people don't like it, and so they won't eat it, and so it isn't nourishing."

Odors. Old-fashioned cooks have long declared that the odor of food cooking is as satisfying as the food itself. Or else they say that the odor of cooking takes away the appetite. The latter may be true in a few cases. It hardly seems necessary to say to intelligent people that odors are not nourishing. Imagine what would become of the cook if she relied upon odors alone for her subsistence!

Water-drinking. That drinking water at meals is harmful is another tradition to which some people still cling. There may be certain pathological conditions that would make this practice harmful. But people in normal health suffer no ill effects from a reasonable amount of water taken with meals. A safe rule at meals is to drink when you are thirsty, with the one limitation not to drink when masticating. The digestion of starch foods should begin in the mouth,

and this can take place only when the food is thoroughly mixed with the saliva. If food is mixed with water the salivary glands are not sufficiently stimulated to action, and the food passes from the mouth without enough of the digestive juice.

One disadvantage of drinking water at meals is that people who do so often think they have a sufficient amount and do not drink between meals. Copious water-drinking is essential for proper elimination. It is a safe rule to take at least six glasses a day, including that taken at meals, and ten glasses are not too much.

Milk. The statement is frequently heard that skimmed milk and buttermilk are more nutritious than whole milk. The absurdity of this is apparent, for the butter-fat of the whole milk has been taken from both of these, and nothing has been added to make up for this loss. Under certain conditions of digestive disorders they may be more easily digested, but they cannot equal whole milk in nutritive value.

Fish. From the time that people first began to discuss food values the word has been passed along that fish is the best food to nourish the brain because of the high per cent. of phosphorus. As has been pointed out in Chapter XIII., there are many foods with more phosphorus than fish. Fish is more easily digested than cheese or dried beans, both of which have a high per cent. of phosphorus. For this reason it is better for the digestive tract, but is no better for the develop-

ment of the brain than for any other part of the body. Murray says: "The shimmering or so-called phosphorescent appearance that fish exhibits in the dark is no evidence of the presence of phosphorus." But this probably accounts for the tradition that fish has a great amount of that luminous matter.

Yeast. It is not true that chilling makes yeast useless. Yeast is a plant that cannot live after a bath of boiling water any more than any other plant, but to chill yeast simply retards its growth. If the temperature of a bread sponge which has been chilled can be raised before other yeasts from the air are deposited in it, the growth of the yeast is not impaired.

Jelly. A warning that is given in many cook-books is not to boil gelatine, as the boiling prevents "jellying." Ten experiments recently performed have shown the untruth of this statement. In every instance the gelatine became firm, in most cases too firm, for the longer the boiling was continued the tougher the jelly became—and this is the reason for not boiling. In these same experiments every acid used in cookery was combined with gelatine, and the only one that prevented "jellying" was fresh pineapple-juice. The cooked pineapple did not have this effect.

When jelly made from fruit-juice and sugar does not "set," it is a mistake to cook it over with more sugar. In nine cases out of ten there is so much sugar that a thick syrup instead of a jelly

is formed. What it needs is more fruit-juice. For those who do preserving regularly it is well to keep on hand one or two cans of fruit-juice well cooked down, so that it may be ready to add. There was a time when the housekeeper gave up in despair when jelly did not "jell." A little later in the science of cookery she cooked the syrup over with more sugar, but with no result. Now she has grown wiser and adds fruit-juice to the syrup before re-cooking it, and obtains very gratifying results.

Mayonnaise Dressing. Another mistake is to hold that mayonnaise dressing that has curdled must be thrown away. If an egg-yolk is broken into a fresh bowl, beaten thoroughly, and the curdled mixture added to it drop by drop, the mayonnaise can be recovered. The three-minute mayonnaise is less likely to curdle than that made the usual way. In this the dry ingredients are put in the bottom of a bowl, a whole egg is added, and this mixture is beaten well together. A third of a cup of oil is added all at once; the whole is beaten until it *begins* to thicken; a second third of a cup of oil is then added, and the whole mixture beaten until it is fairly stiff. Some people like to use the dressing as it is at this stage, but those who prefer a thick mayonnaise must add another third of a cup of oil and beat until it is stiff. In using this method it is not necessary to have the bowl chilled, and the whole process takes literally but three minutes of the time of an or-

dinarily brisk person. The extra cost of the egg-white is not worth considering in the cost of the whole in consideration of the amount of time saved.

Measurements. It is too bad to bring into disrepute so old and well-established a tradition as that "a pint's a pound the world around." This is true of sugar and butter, but of scarcely any other food materials. A standard measuring-cup holds half a pint. Two cups of sugar make a pound, but it takes four cups of flour to make a pound, and about four cups of ground coffee to make a pound. Accurate measurement is the only safety for the housekeeper.

Manufacturers' Labels. The housekeeper has been warned so often to read the labels on all manufactured articles that it seems unnecessary to repeat the warning. But to this should be added the warning that the whole truth is not always told on the label. The law requires certain statements in regard to preservatives and the like. The manufacturer may add any information he chooses, and the whole truth might tell too much. Take, for example, the statement sometimes found on the label of meat extracts, "that it is good for muscle and bone." The sense in which this is true is that the chief value of a beef extract is in stimulating the flow of digestive juice, which means better digestion and assimilation of foods that are good for muscle and bone.

The beef extract has practically no protein, and therefore does not in itself build muscle and bone.

Advertisements. Advertisements are often more misleading than labels, and there is no law governing their accuracy. For example, soup is often spoken of as very nutritious. A little thought will show that soup is chiefly water—often as high as ninety-nine per cent.—and that the amount of nutriment eaten as soup by any one person is negligible. Soup has the value already attributed to meat extracts, that of stimulating the flow of digestive juices, and therefore is of value in the dietary. But it is ridiculous to speak of clear soup as a nutritious food.

It is also well to remember in reading advertisements that give analyses of food value that the several food constituents are not always available to the human body, and a food that has a very high per cent. of protein may not be as valuable for body repair as it sounds.

Colors. Certain communities have certain prejudices in regard to the colors of foods. It has already been stated that one community demands eggs with a light-colored shell, another eggs with a dark-colored shell. The color of the shell has no relation to the nutritive value of the egg, and the wise housekeeper can gain an advantage by buying at a lower price the egg with the color of shell that is not popular in her community.

There is also a fashion in cheese. If light cheese is more in demand than yellow cheese,

naturally the light cheese will bring a few cents more to the pound than the dark, but one is not any better food than the other, nor is there necessarily any difference in flavor. Again the wise housekeeper will take advantage of this fact.

Reference has already been made to the prejudice in favor of white rice, which has resulted in the loss of the valuable mineral matter in the husk of the naturally brownish rice. The day will soon come when this brown, unpolished rice will be as cheap and as easy to obtain as the white rice of less nutritive value.

The prejudice in regard to color is in a measure partly responsible for the unpopularity of oleomargarine. Even though the factory is perfectly sanitary and the articles used are clean and wholesome, the housekeeper is opposed to the use of uncolored oleomargarine instead of butter.

Prices. The housekeeper is frequently urged to watch the market prices given in the daily paper, as if she could judge immediately what she ought to pay her local dealer. If the prices which the dealer gives do not compare favorably with these prices, the careful buyer questions herself first and finds fault with the dealer afterward. Is she exacting from the dealer so much in service that he must put an exorbitant price on what he sells in order to cover this other expense? For instance, is she telephoning two or three times a day for him to send her supplies, or does she make out a list and require no, or only one, tele-

phone call and only one delivery? Does she demand that he carry perishable foods out of season? If she herself is reasonable in these matters, are the majority of the dealer's customers as reasonable as she? Unfortunately, the careful buyer has to pay for the wastefulness of the careless buyer, as far as cash prices are concerned.

As has been said, the careful housekeeper does not accept the sensational statements made by newspapers and advertisements in regard either to prices or to the merits of food materials. Housekeeping is much more interesting if the spirit of adventure and experimenting which so often characterize a bridge game is carried into the processes of marketing and cooking. The housekeeper who tries different ways of playing her hand has more interest in the game.

Tests. The housekeeper in her kitchen must work as nearly as she can on the laboratory principle. She must make tests under right conditions. She must understand the value of the "control test."

The principle of the control test is that the experiment under consideration shall be tried twice under the same conditions, but with the important point varied. It is best, when possible, to try the two experiments at the same time, as this is the easiest way to insure like conditions. For example, to find out whether there is any difference in the color of spinach when cooked in a covered or an uncovered vessel, one-

half the amount needed for the family at one meal should be cooked in each way. Then every condition is the same except that of the covering, and the result means something.

Control tests may be carried on in almost every cookery process. For example, certain things that have been baked in a quick oven may be tried in a slow oven, or the slow oven may be changed to a quick oven, and the texture and lightness of the articles compared. Another observation of interest for a cook to make for herself is to put half the vegetables into cold water and bring it to the boiling-point, and the other half into boiling water. By noticing the flavor and texture of the vegetables cooked under both conditions the cook will be able to convince herself of the best methods for cooking, or, better still, to formulate new rules. Each experiment must be tried a number of times for any sure conclusion, and the more complicated the process, the greater the number of experiments that should be made.

Tests of prices are very enlightening. It is sometimes surprising to see the variation in costs in the "bob" and "nabob" parts of town. The "nabob" dealer must be paid for his more elaborate equipment, larger store, and higher rent. The most striking differences in price are shown between the prices of the large market and those of the neighborhood dealer, but the differences on the same day between local dealers whose

conditions seem the same are often surprisingly great.

The housekeeper with an alert mind, who tries experiments and so is able to give reasons for the faith that is in her, is rewarded by the profit she brings to the family and the pleasure she wins for herself.

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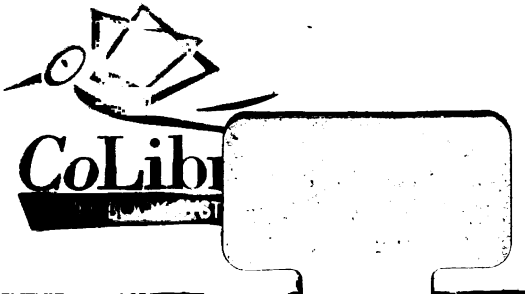
THE END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